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# New York State Economics Association

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# Fast Food Consumption and Child BMI in China: Application of Switching Regression Model

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#### ABSTRACT

With rapid economic growth, China has witnessed the epidemic of childhood overweight and obesity. This paper contributes to this line of empirical study by employing switching regression model to study two groups of children: those who patronize fast food and those who do not. Moreover, we estimate and compare the counterfactual weights of children in each of the two categories. Using the data from 2006 China Health and Nutrition Surveys (CHNS), we verify the positive impact of fast food consumption on children's BMI and also find that children's self-selection on fast food consumption affects two groups of children unevenly.

#### INTRODUCTION

The rates of child obesity are on the rise in both developed and developing countries. In the U.S., child obesity has more than tripled in the past 30 years. According to the data from Centers for Disease Control and Prevention, the percentage of children aged 6–11 years in the United States who were obese increased from 7% in 1980 to nearly 20% in 2008; similarly, the percentage of adolescents aged 12–19 years who were obese increased from 5% to 18% over the same period.

In 2008, more than one third of children and adolescents were overweight or obese. In China, 8% of 10to 12-year-olds in China's cities are considered obese and an additional 15% are overweight, according to Chinese Ministry of Education. Figures from the China national surveys on the constitution and health of schoolchildren showed the prevalence of obesity among children aged 7 to 18 had increased four times in the 15 years between 1985 and 2000, while figures for the number of overweight children in the same age range and time period had increased 28 times over.

The epidemic of obesity among young people has attracted much attention among public health experts and researchers to investigate possible determinants. From the perspective of physiology, weight gains are simply the result of imbalance of calorie intake and energy expenditure. Fast food consumption has been the leading suspect to blame for the alarming rise of childhood obesity. In the U.S., the percentage of fast food consumption in children's total calorie-intake has gone from 2 percent to nearly 10 percent between 1970s and 1990s (Ebbeling et al., 2002). Due to efficient and widespread advertisement of fast food restaurants, the Chinese children get to know and embrace fast food at an astonishing pace. A study on an eight-province

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survey indicates, of the total calorie intake, the fat intake of urban Chinese boys aged 12-15 jumped from 17% in 1989 to almost 30% in 1993 (Chen C. 2002). Bowman et al. (2004) compared children who ate fast food with those who did not and suggested that fast food consumption among children in the U.S. appears to negatively affect the quality of children's diet in ways which may increase the risk of obesity.

However, their study did not directly estimate the impact of fast food consumption on quality of children's diet or children's weight in magnitude. Another appealing factor researchers think of often is Television viewing. In fact, TV viewing works on the both sides of energy intake and expenditure equation from several aspects. First, it reduces the physical activity level; second, it creates extra calorie intake during screen time which increases the risk of being overweight. Andersen et al., (1998) documents the children engage in the most television viewing tend to be the most overweight; third, children exposed to more advertisement through television viewing tend to be more in favor of advertised food. A report from WHO found strong evidence that food promotion affects children's food purchasing-related behaviors and therefore influences their food preference (Gerard Hastings et al. 2006). Chou et al. (2008) concluded that banning those food advertising practices could reduce the incidence of children overweight by 18%.

Furthermore, "internalities" as Cutler et al. (2002) explain as presence of poor self-control may contribute to explain the rising rate of obesity. This suggests that there are some people who are especially susceptible to overweight or obesity. They desire to eat less or more healthy food, but for some reason, it is more difficult for them to achieve the goal. Interestingly, it is similar to young children who are exposed and manipulated by fast food advertisement tend to consume more of the advertised food. Jennifer L. Harris et al. (2009) reported that the evidence indicates food advertising increases children's preferences for the food advertised and their requests to parents for those foods at both the brand and category level. Therefore, it would be ideal to track the change on children's weights when they make opposite decision on fast food consumption. However, it is not practical to examine the linkage between the choice of fast food consumption and children's average body weight unless there are two identical groups of children who make opposite decision on fast food consumption on fast food consumption. Some other determinants were also considered in the recent studies, such as social economic status, biophysical characteristics, (Murasko 2009, Chang and Nayga 2009, Andreyeva et al 2011).

The linkage between fast food consumption and children's BMI has been mainly focused on how factors such as advertisement, television viewing increase the amount of fast food consumption, and therefore, increase the risk of being overweight and obese. Little has been done to look at the impact of the decision to adopt fast food by children on their weight. Although young children may be questioned on their ability to make rational decisions, they are old enough to have preference and make requests for food, which is vividly demonstrated in China. Due to China's one-child policy, meaning a married couple is allowed to have only one child in the family, the 2-4-8 structure of extended family (two parents, four grandparents and eight great grandparents) usually lead to overfeeding the "little emperor" and being manipulated by his/her food preference. Therefore, it is appropriate to examine the impact of children's decisions on whether to adopt fast food on their weights. This paper aims to contribute to the literature on fast food consumption on children's weight gains by providing a micro perspective on the topic of fast food adoption and children's BMI in China.

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Our research employs switching regression model to investigate two groups of children in China: those who patronize fast food and their counterparts who do not. Moreover, we estimate and compare the counterfactual weights of children in each of the two categories. Thus, the counterfactual weights of children who patronize fast food is compared with their counterparts who do not eat past food; and the counterfactual weights of the children who do not eat the fast food is compared with those who patronize it. Our empirical results support the hypothesis that fast food consumption has positive impact on BMI of children in China. Children who select to eat fast food, are from wealthier households, or live in urban areas, or have parents who have relatively higher formal education or older fathers, or have mothers who have relatively lower BMIs. Among those who eat the fast food, boys and children whose mothers are not engaged in primary production activities such as fishing, farming and hunting tend to have higher risk of being overweight and obese.

The rest of this paper is organized as follows. The econometric model is introduced in Part Two. Part Three describes the data. Empirical models and results are presented in Part Four. And Part Five concludes.

#### THE ECONOMETRIC MODEL

In order to determine the counterfactual BMI of children who eat fast food (i.e., fast food eaters (FFE)) and non fast food eaters (NFFE), an endogenous switching regression model of fast food eating decision is employed. The model uses a probit model in a first stage to determine the relationship between the decision to eat the fast food and possible determinants of BMI. The second stage regression estimates the determinants of BMI for FFE and NFFE conditional on specific criterion function. To clarify the method, consider a situation where a child could consider eating the fast food or not. Let  $A_i^* > 0$  be a latent variable capturing the expected BMI from eating the fast food. We specify the probit model of the decision to eat the fast food as

$$A_i^* = Z_i \alpha + \eta_i \text{ with } A_i = \begin{cases} 1 & \text{if } A_i^* > 0 \\ 0 & \text{otherwise,} \end{cases}$$
(1)

Where  $Z_i$  is a vector of factors influencing decision to eat fast food;  $\alpha$  is a vector of unknown parameters; and  $\eta$  is an error term with mean zero and variance of  $\sigma_{\eta}^2$ . Probit maximum likelihood estimation is employed to estimate the parameters of equation 1. The decision to eat fast food or not is influenced by BMI. Let the child's BMI function be y = f(X), where y is BMI and X is a vector of possible factors that determines a child BMI. To estimate a separate regression function for each of the two situations, we specify the following BMI functions:

Regime 1 (*FFE*):  $y_{1i} = X_{1i}\beta_1 + \varepsilon_{1i}$  if  $A_i = 1$  (2a)

Regime 2 (*NFFE*):  $y_{2i} = X_{2i}\beta_2 + \varepsilon_{2i}$  if  $A_i = 0$  (2b)

Where  $y_{1i}$  and  $y_{2i}$  are BMI of FFE and NFFE respectively, and  $\beta$  is the vector of parameters to be estimated. The error terms in equations (1), (2a) and (2b) are assumed to have a triumvirate normal

distribution with zero mean and covariant matrix 
$$\Sigma$$
, (i.e.,  $(\eta, \varepsilon_1, \varepsilon_2) \square N(0, \Sigma)$ ), with  $\sum_{\substack{\Sigma = \begin{bmatrix} \sigma_{\eta}^2 & \sigma_{\eta_1} & \sigma_{\eta_2} \\ \sigma_{1\eta} & \sigma_1^2 & . \\ \sigma_{2\eta} & . & \sigma_2^2 \end{bmatrix}}$ .

Where  $\sigma_{\eta}^2$  is the variance of the error term in the selection equation (1) which can be assumed to be equal to 1 since the coefficients are estimable only up to a scale factor (Lee, 1978; Maddala, 1983),  $\sigma_1^2$  and  $\sigma_2^2$  are the variances of the error terms in the productivity functions (2a) and (2b),  $\sigma_{1\eta}$  represent the covariance of  $\eta_i$  and  $\varepsilon_{1i}$ , and  $\sigma_{2\eta}$  is the covariance of  $\eta_i$  and  $\varepsilon_{2i}$ . Note that  $y_{1i}$  and  $y_{2i}$  are not observed simultaneously implying the covariance between  $\varepsilon_{1i}$  and  $\varepsilon_{2i}$  is not defined and therefore indicated as dots in the covariance matrix. Since the error term of the selection equation (1) is correlated with the error terms of the BMI functions (2a) and (2b), the expected values of  $\varepsilon_{1i}$  and  $\varepsilon_{2i}$  conditional on the sample selection are nonzero and are defined as:

$$E\left[\varepsilon_{1i}\left|A_{i}=1\right]=\sigma_{1\eta}\frac{\phi(Z_{i}\alpha)}{\Phi(Z_{i}\alpha)}=\sigma_{1\eta}\lambda_{1i},$$
(3a)

$$E\left[\varepsilon_{2i} \left| A_i = 0 \right] = \sigma_{2\eta} \frac{\phi(Z_i \alpha)}{1 - \Phi(Z_i \alpha)} = \sigma_{2\eta} \lambda_{2i}$$
(3b)

Where  $\phi$  (.) and  $\Phi$  (.) are the standard normal probability density function and normal cumulative density function respectively,  $\lambda_{1i} = \frac{\phi(Z_i \alpha)}{\Phi(Z_i \alpha)}$ , and  $\lambda_{2i} = \frac{\phi(Z_i \alpha)}{1 - \Phi(Z_i \alpha)}$ . It is noteworthy that if the estimated covariance

 $\hat{\sigma}_{1\eta}$  and  $\hat{\sigma}_{2\eta}$  are statistically significant then the decision to eat and the BMI are correlated. This implies there is evidence of endogenous switching and the null hypothesis of the absence of sample selectivity bias is rejected.

A more efficient method of estimating endogenous switching regression models is full information maximum likelihood (FIML) method (Lokshin and Sajaia, 2004; Greene, 2000). The logarithmic likelihood function given the previous assumptions regarding the distribution of the error terms is

$$\operatorname{In}L_{i} = \sum_{i=1}^{N} \left\{ A_{i} \left[ \operatorname{In}\phi\left(\frac{\varepsilon_{1i}}{\sigma_{1}}\right) - \operatorname{In}\sigma_{1} + \operatorname{In}\Phi\left(\theta_{1i}\right) \right] + (1 - A_{i}) \left[ \operatorname{In}\phi\left(\frac{\varepsilon_{2i}}{\sigma_{2}}\right) - \operatorname{In}\sigma_{2} + \operatorname{In}(1 - \Phi(\theta_{2i})) \right] \right\}$$
(4)

where  $\theta_{ji} = \frac{Z_i \alpha + \rho_j \varepsilon_{ji} / \sigma_j}{\sqrt{1 - \rho_j^2}} \frac{1}{2}$ , with j = 1, 2, and  $\rho_j$  denoting the correlation coefficient between the error

term  $\eta_i$  of the selection equation (1) and the error term  $\varepsilon_{ii}$  of equations (2a) and (2b), respectively.

#### CONDITIONAL EXPECTATIONS, TREATMENT, AND HETEROGENITY EFFECTS

The endogenous switching regression model can be used to compare observed and counterfactual BMIs. Thus we could compare the expected BMI of the child who eats fast food (i.e., (a)) with the BMI of a child who does not eat (i.e., (b)); and to investigate the expected BMI in the counterfactual hypothetical cases (i.e., (c)) that the child who eats fast food does not eat it, and (i.e., (d)) that the child who does not eat fast food eats it. The conditional expectations of the BMI in the four cases are presented in Table 1 and defined as follows:

$E(y_{1i}   A_i = 1) = X_{1i}\beta_1 + \sigma_{1\eta}\lambda_{1i}$	(5a)
$E(y_{2i}   A_i = 0) = X_{2i}\beta_2 + \sigma_{2\eta}\lambda_{2i}$	(5b)
$E(y_{2i}   A_i = 1) = X_{1i}\beta_2 + \sigma_{2\eta}\lambda_{1i}$	(5c)
$E(y_{1i}   A_i = 0) = X_{2i}\beta_1 + \sigma_{1\eta}\lambda_{2i}$	(5d)

Cases (a) and (b) along the diagonal of Table 1 represent the actual expectations observed in the sample. Cases (c) and (d) represent the counterfactual expected outcomes.

Table 1: Conditional Expectations, Treatment, and Heterogeneity				
	Decision Stage			
Subsamples	To Eat	Not to Eat	Treatment Effects ⊤⊤	
Fast Food Eaters	(a) $E(y_{1i}   A_i = 1)$	(c) $E(y_{2i}   A_i = 1)$		
Non Fast Food Eaters	(d) $E(y_{1i}   A_i = 0)$	(b) $E(y_{2i}   A_i = 0)$	TU	
Heterogeneity effects	BH₁	BH <sub>2</sub>	TH	

Note (a) and (b) represent observed expected BMI, and; (c) and (d) represent counterfactual BMI.

 $A_i = 1$  if the child eats the fast food; and  $A_i = 0$  if fisher does not eat the fast food

 $y_{1i} = BMI$  of the child if the child eats fast food

 $y_{2i} = BMI$  of the child does not eat fast food.

TT: the effect of the treatment (i.e. eating) on the treated group (i.e. children who eat the fast food);

TU: the effect of the treatment (i.e., eating fast food) on the untreated group (i.e., children who do not eat fast food);

BH<sub>1</sub>: the effect of base heterogeneity for children who eat the fast food (i=1), and do not eat the fast food (i=2) TH= (TT-TU), i.e., transitional heterogeneity.

In addition, following Heckman et al, (2001) and Di Falco et al (2011) we calculate the following effects:

$$TT = E(y_{1i} | A_i = 1) - E(y_{2i} | A_i = 1) = X_{1i}(\beta_1 - \beta_2) + (\sigma_{1\eta} - \sigma_{2\eta})\lambda_{1i}$$
(6a)  
$$TU = E(y_{1i} | A_i = 0) - E(y_{1i} | A_i = 0) = X_{1i}(\beta_1 - \beta_2) + (\sigma_{1\eta} - \sigma_{2\eta})\lambda_{1i}$$
(6b)

$$PH = E(y_{1i} | A_i = 0) = E(y_{2i} | A_i = 0) = (X - X_{2i} | B_i =$$

$$BH_{1} = E(Y_{1i} | A_{i} = 1) - E(Y_{1i} | A_{i} = 0) = (A_{1i} - A_{2i})p_{1i} + O_{1\eta}(A_{1i} - A_{2i})$$
(6C)

$$BH_2 = E(y_{2i}|A_i = 1) - E(y_{2i}|A_i = 0) = (X_{1i} - X_{2i})\beta_{2i} + \sigma_{2\eta}(\lambda_{1i} - \lambda_{2i})$$
(6d)

(1) The treatment "eating fast food " on violation (TT) is the difference between (a) and (c), which is given by equation (6a); (2) The effect of the treatment on non-eaters of fast food (TU), i.e., children who do not eat the fast food, is the difference between (d) and (b) which is given by equation (6b); (3) The effect of heterogeneity of the eaters of the fast food is the difference between (a) and (d); (4) The effect of base heterogeneity of children who do not eat the fast food is the difference between (a) and (d); (5) The transitional heterogeneity (TH) is obtained by comparing as the difference between (TT) and (TU). Thus we seek to determine whether the effect of eating fast food is smaller or larger for children who actually eat the fast food and those who do not eat the fast food relative to their counter factual case.

#### DATA DESCRIPTION

The data are drawn from China Health and Nutrition Survey (CHNS) in the year 2006. CHNS, a nationally representative survey conducted under Carolina Population Center and the National Institute of Nutrition and Food Safety at the Chinese Center for Disease Control and Prevention, was designed to collect data on issues related with health, nutrition, family planning at the community, household, individual level for both adults and children. The data were collected through face-to-face interview with questionnaires and physical examination. The sample in this study includes children aged 2-12 who have information on the variables of interests listed as below. Measurement for height and weight were taken in person by doctors or trained examinee.

From the data set, the variables of interest include BMI of a child and his/her mother, whether the child eats fast food or not, the gender of the child, years of education of the child (which is a proxy for the child's age), whether the child is currently in school or not, whether the child lives in an urban or rural area, whether the child likes watching TV or not, household income, mother's years of formal education, father has high blood pressure, father's age, mother's age, whether father lives in the same house or not, and whether mother's occupation is in primary production or not. The descriptive statistics of the variables is presented in Table 2 (available upon request). The mean BMI of both groups of children (i.e., those eat the fast food and those who do not eat it) is 18.09. Comparing the two groups, the mean of those who eat it is slightly higher than that of their counterparts who do not. Secondly, the proportion of males in the total sample is 0.53. However, there are more females among fast food eaters and fewer females among their counterparts who do not eat fast food. Thirdly, only less than one percent of the children are not currently in school and the mean years of education is about 6. Furthermore, 30 percent of all the children like watching TV. However, among those who eat fast food, 43 percent like watching TV while only 41 percent likes watching it among their counterparts who do eat fast food. Finally, a high proportion of the households (around 90 percent) have both parents in the household, with the proportion being higher for children who patronize fast food than for the others who do not eat it. Although the number of observation for each variable exceeds a thousand, due to missing observations across variables, the number of complete observations used for the actual estimation is slightly below seven-hundred.

#### **EMPIRICAL MODEL AND RESULTS**

#### THE EMPIRICAL MODEL

The empirical equations to be estimated are probit regression of decision to eat fast food or not; and a regression equation of determinants of BMI of the children. The decision (selection) equation, which is equivalent to equation (1), is specified as:

$$EFF = f(\mathbf{A}), \tag{7}$$

The dependent variable is binary taking the value 1 if the child eats fast food and 0 otherwise. The vector of explanatory variables  $(i.e., \mathbf{A})$  include the gender of the child, years of education of the child, whether the child is currently in school or not, whether the child lives in an urban or rural area, whether child likes watching TV or not, mother's BMI, household income, mother's years of formal education, whether father has high blood pressure or not, father's age, mother's age, and whether the father lives in the same household or not.

The separate BMI function for eaters of fast food and non-eaters similar to equation (2) is as follows:

$$\ln(BMI) = g\left(\mathbf{A}_{1}, \mathbf{Z}\right) \tag{8}$$

Where In is a notation for natural logarithm,  $A_1$  includes all the variables in the vector A, except father's years of formal education; and the vector Z includes additional variables like father lives in the same household and whether mother is engaged or not in primary production activities such as fishing, faming and hunting.

#### RESULTS

Estimated results for the endogenous switching regressions are columns 3 and 4 (i.e., denoted (2) and (3)) in the Table 3, respectively. The estimations were implemented in STATA using the *movestay* command (Lokshin and Sajaia, 2004). The result of the likelihood ratio test reported in the table rejects the hypothesis at 1 percent significant level that the three equations are jointly independent. In addition, the correlation term  $\rho_i$  in one equation is negative and statistically significant at 1% level indicating we fail to reject the hypothesis of sample selection bias. The parameter has a negative sign in the equation for fast food eaters implying children who chose to eat fast food have significantly higher BMI than a randomly selected child from the sample; and on the other hand, the parameter was not significant in the non-eaters' equation indicating those who select not to eat fast food do not have higher or lower BMI than a randomly selected child from the sample.

	(1)	(2)	(3)	
	Endogenous Switching Regression			
Model	Loait	Fast Food Eaters	Non-Fast Food Eaters	
Dependent Variable	Eat Fast Food (1/0)	Log(BMI)	Log(BMI)	
Male Children	-0.018	0.078	0.008	
	(0.117)	(0.034)**	(0.019)	
Years of Education of Child	-0.001	0.0178	0.202	
	(0.026)	(0.007) ***	(0.004)***	
Currently in school	-0.017	-0.0226	-0.046	
	(0.225)	(0.056)	(0.026)*	
Urban dweller	0.991	0.008	-0.077	
	(0.134)***	(0.051)	(0.030)***	
Likes watching TV	0.0005	-0.005	0.0183	
	(0.163)	(0.040)	(0.025)	
Mother's BMI	-0.0135	0.005	0.0046	
	(0.007)*	(0.004)	(0.0026)*	
Household Income (1.000.00)	0.197	0.004	-0.038	
	(0.067)***	(0.0123)	(0.020)*	
Mother's years of formal	0.055 <sup>′</sup>	0.0004	0.0048́	
education	(0.021)***	(0.006)	(0.0034)	
Father's years of formal	0.077 <sup>′</sup>	· · · ·	, , , , , , , , , , , , , , , , , , ,	
education	(0.230)***			
Father has High Blood	-0.300	0.007	-0.0046	
Pressure	(0.416)	(0.0719)	(0.0710)	
Father's Age	0.034	-0.007	0.006	
-	(0.019)*	(0.005)	(0.0036)*	
Mother's Age	-0.029	0.001	-0.0062	
	(0.023)	(0.006)	(0.0030)**	
Father Lives in the House			-0.069	
			(0.0266)***	
Mothers in Primary Production		-0.107	-0.010	
		(0.049)**	(0.018)	
Constant	-2.270	2.936	2.697	
	(0.687)***	(0.211)***	(0.113)***	
$\sigma_{\cdot}$		0.214***	0.208***	
i		(0.015)	(0.020)	
$ ho_i$		- 0.782***	-0.041	
<i>, t</i>		(0.082)	(0.257)	
Likelihood Ratio (LR) test of i	independent Equations:	chi2(2) = 24.31 Pi	rob > chi2 = 0.0000	

#### Table 3: Full Information Maximum Likelihood Estimate of the Switching Regression

\*\*\*, \*\*, \* signify significant at 1%, 5% and 10% respectively.

In the selection (i.e., Logit /Probi ) regression, the probability of selecting into eating fast food depends on whether the child lives in an urban or rural area, the mother's BMI, household income, father or mother's years of formal education, and father's age. Except father's age and mother's BMI which are significant at 10 percent level, all these variables are highly significant at 1 percent level. Computed average partial effects indicates, on the average, the probability that a child eats fast food increases by 0.3 if the child lives in an urban area. Secondly, a child whose mother has a relatively high BMI is less likely (albeit weakly) to patronize fast food. Indeed, one percentage increase in a child's mother's BMI lowers the probability of eating fast food by 0.003. Thirdly, children from homes that are relatively well-off are more likely to eat fast food. A

percentage increase in household income increases the probability of eating fast food by 0.05. Fourthly, the years of formal education of both parents increases the probability of the child eating fast food. The corresponding elasticity is approximately 0.02 for each of the parents. Finally, the older the father is the more likely it is for the child to eat fast food. Specifically, on the average, the probability of a child eating fast food increases by 0.008 if the father's age increases by 1 percent.

Next, regarding the determinants of BMI among the children who eat fast food, we found that boys weigh more than girls; years of the child's education positively correlates with BMI and mothers who are into primary production have children with lower BMIs. Specifically, on the average, boys have 0.04 percent higher BMI that their female counterparts. Secondly, a percentage increase in a child's education increases the BMI, on the average, by 0.11 percent. Finally, children whose mothers are into primary production activities such as farming, hunting and fishing, have 0.01 percent lower BMI. This finding is interesting and underpins the fact that mothers are likely to engage their children in primary production activities could reduce their BMI. Consequently, for children who eat fast food; engaging them in physical activities could reduce their BMI.

Among the children who do not eat fast food, years of education and fathers age positively correlates with their BMI; while BMI decreases if a child is currently in school, dwells in an urban area, come from a relatively well-off household, the mother is relatively older, and father lives in the same household. The computed elasticities show BMI will increase by 1.11 and 0.24 percent, respectively, if the child's years of education or father's age increases by one percent. Secondly, a child who is in school has a 0.04 percent lower BMI than his/her counterparts who are not currently in school. Thirdly, children in urban areas or have their father living in the same house have 0.017 and 0.062 percent lower BMI respectively than their counterparts. Furthermore, while increasing household income by one percent decreases the child's BMI by 0.005 percent, the BMI will decrease by 0.23 percent if the mother's age is 1 percent higher.

Finally, Table 4 clearly reveals eating fast food increases BMI among eaters of fast food; and if those who do not currently eat the fast food were to eat it, they would have had increased BMI as well. Specifically, the average BMI of a typical child who eats fast food is 19.24 but would have been lower (18.61) if the child did not select to eat the fast food. On the other hand, for a typical child who does not eat fast food, eating fast food would have increased his/her BMI by 3.88 percent.

	Table 4:	Conditional	Expectations,	Treatment,	and H	leterogeneity
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	Decision Stag	le	
Subsamples	Eating	Not Eating	Treatment Effects
Fast Food Eaters	(a) 19.2448	(c) 18.6108	<b>TT</b> =0.634
Non Fast Food Eaters	(d) 17.7338	(b) 13.8545	<b>TU</b> = 3.8793
Heterogeneity effects	$BH_1 = 1.511$	$BH_2 = 4.7563$	<b>TH</b> =-3.2453

#### CONCLUSION

This study which sought to investigate the impact of fast food consumption on BMI of children in China has unearthed some interesting results with far reaching policy implications. First the results support the

hypothesis that fast food consumption has positive impact on BMI of children in China. Children who select to eat fast food, are from wealthier households, or live in urban areas, or have parents who are have relatively higher formal education or older fathers, or have mothers who have relatively lower BMIs. In order to discourage these children from patronizing such foods, public policy must target urban households with educated parents who are relatively better off. Among those who eat the fast food, policy must be directed to boys, and mothers who are not engaged in primary production activities such as fishing, farming and hunting which engage children in physical activities that could reduce their weights. Finally we found that children who self- select to eating fast food have higher BMI than a child selected at random, and those who refrain from patronizing such foods are of BMI not different from that of a child selected at random.

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# **Government and Business: An Evolving Relationship**

# Allison Beres<sup>\*</sup>

#### ABSTRACT

History is not a progressive timeline, it is a dynamic spectrum. The issues of today are no different than those of the past, but how are we to learn how to address these issues of we do not acknowledge the past? This paper analyzes the relationship between the federal government and business throughout the history of the United States. To what extent should the government be involved with the economy and what were the effects of various degrees of involvement? Using several periods during the history of the United States, this paper analyzes just that question.

#### INTRODUCTION: UNDERLYING PROBLEMS

Once again the alarm has been set off by the voices of Occupy Wall Street against the inequalities created by our capitalist society. However, for a system that champions innovation, self-interest, and a free market, why would people be disgruntled with capitalism? Over the course of history of the United States, capitalism has been accused of creating disparities in society and an unfair playing field in the economy. The motto of Occupy Wall Street, "We are the 99%," attacks the problem of income inequality in the United States, but there are more underlying problems. The real problem is the relationship between business and government and how business has come to overpower the voice of the American citizen.

The relationship between Washington and business has become troublesome. In the article: "Selfinterest, without morals, leads to capitalism's self-destruction," Jeffrey Sachs makes the point, "The day may soon arrive when money fully owns our politics, markets have utterly devastated the environment, and gluttony relentlessly commands our personal choices" (2012). A government ruled by business was not the Jeffersonian view of the United States and Jefferson's ghost would probably appear in a Christmas Carol style before business completely overwhelmed democracy. The relationship between democracy and capitalism is a story with the complexity of a Homeric epic. There are highs and lows, times when one dominates the other, and yet they trudge on together. Since the beginning of the United States, the Founders debated issues pertaining to the economy like the nature of corporations. The development of the American economy highlighted the relationship between capitalism and democracy and how the early government had a pro-business agenda.

In section II, the Founder's vision of the United States economy will be discussed. From the time of the Constitutional Convention in 1787, ideas about the economy and the government had already been heavily debated. From the role of government in the economy to the role of companies, the debates were widespread among the Founder's. Also some ideas from Adam Smith definitely influenced not only the

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United States, but the world. The new ideas in America gave rise to entrepreneurship and an 'American Exceptionalism.' America was a new place with an energized spirit for commerce and split from the traditions of Europe. Democracy and business grew together and the relationship remained equal between the two forces. However, business would eventually rise up and take dominance.

Section III will discuss the economy of the Gilded Age and the reforms of the Progressive Era. The Gilded Age marked a period where capitalism and democracy went hand in hand in which business steered government. The period that followed, the Progressive Era, was a victory for the voice of the citizen because the federal government took major actions to control big business. However, it would take the financial panics of 1873 and 1893, a labor movement, and unparalleled industry concentration for the government to act. It was a time when democracy was threatened because business was an unstoppable machine. The economy grew, but at undesirable expenses to society with unfair wages and hours and also income inequality.

Section IV will discuss the interaction of business and government today. Today is a rosy picture of K Street lobbyists swaying government policy. Not all is lost in the sea of corporate money and interests because there are citizens fighting for their voice. There has been much said about the Occupy Wall Street movement, but they are standing up for what they believe in. However, the citizen is not just a citizen, but a stockholder and corporations will do just about anything to make the shareholders happy. Stockholders do have a voice in corporations and the more we buy, the more corporations 'invest' in Washington.

Last, but not least, section V will include concluding remarks and how corporations should interact in society and the true relationship of corporations and democracy. What happens when the democratic process is severely threatened as in the Gilded Age? The Progressives were steadfast and people were aware of the dangers of business to society. Many of the issues analyzed in the Gilded Age are now issues we face now. Income inequality is nothing new and the one percent has been attacked before. Before we all start pointing fingers at the one percent, we should undercover what is really happening. To change the toxic relationship between capitalism and democracy, the way business and the government interact has to change. The people of Occupy Wall Street might seem like a bunch of 'radicals' who are just hanging around, but they are only merely expressing views that have been in existence throughout American history.

#### WORKING TOGETHER: THE EARLY ECONOMY AND THE GOVERNMENT

After the Treaty of Paris ended the American Revolution in 1783, a new nation emerged on the world stage. America was a nation that promoted liberty, equality, and opportunity both politically and economically. The rules of the Old World had been washed away and America was unlike anything else the world had seen. A kind of 'American Exceptionalism' arose and foreigners even took notice of the different values and attitudes of the new world such as individualism. With individualism, the rights of the

individual and how the government was to safeguard those rights, by protecting private property, became a prominent issue to the Founders.

Because of the Colonial period in America, citizens of the new country were not keen to the idea of heavy government intervention in the economy or in their daily lives. The government's purpose was to protect property rights and liberties. After heavy government intervention by the British during the Colonial Period with endless tariffs and regulations, the citizen's of the United States had had enough of the government regulating the economy. Thomas Paine even said in his 1776 pamphlet *Common* Sense, "Government, even in its best state, is but a necessary evil: in its worst state, an intolerable one" (Buder, 2009, pp. 47). However, Thomas Paine was not the only one to theorize about the role of government.

Adam Smith, a political philosopher turned economist, believed in limited government and a *laissez-faire* approach to the economy. He believed that the political entity must protect an individual's liberty and property (Buder, 2009, pp. 57). Citizens promoted the common good by pursuing individual interests and this created competitive markets. Even though Smith embraced a *laissez-faire* attitude, Smith still had role for government. The government should limit itself to maintaining the police and courts and undertake activities like providing public goods like education (Buder, 2009, 60). Smith's ideas about the role of government in the economy would be further debated during the Constitutional Convention of 1787.

The new Constitution granted new powers to the federal government like establishing a national currency, postal roads, and a federal post office. When it came to the question of corporations, James Madison wanted the federal government to authorize charters to establish corporations, but this power was eventually granted to the states (Buder, 2009, 64). The federal government chartering corporations was reminiscent of the British East India Company, which was given a charter by the British crown. The creation and regulation of corporations was under the authority of the states. For a company to be 'incorporated' meant that private individuals would pursue public interests. One of the public interests included the creation of public goods like roads, bridges, and canals. The government was basically giving out contracts for companies to build infrastructure. A charter outlined specific responsibilities for a corporations had a specific purpose. For Chief Justice John Marshall, corporations were creations of the law and were bound by their charters, an artificial entity.

The early federal courts interpreted laws in favor of economic growth. John Marshall's court was probusiness, but not in way that we understand it today. The ruling nearly reinforced the government as a referee in the economy. For example in *Dartmouth* College *v. Woodward* (1819), the court ruled that the charter granted by King George III in 1769 had to be respected and kept Dartmouth a private institution (Swarthmore College, 2012). The charter, which described the purpose of the college, set up a structure to govern it and land for the institution was protected by the contract clause of the Constitution. The case was a major victory for the American corporation and others would follow. Also another ruling that fostered economic growth and competition like *Gibbons v. Ogden* (1824) stated that it was the responsibility of the federal government to regulate interstate commerce. The government looked out for the interests of business, while at the same time looking out for the rights of citizens. Probably a major proponent of a collaborative relationship between business and government was Alexander Hamilton, the man behind the idea for a central bank. Being a Federalist, Hamilton believed that business and government could work together to promote the common good. The nation was expanding due to territorial acquisitions like the Louisiana Purchase in 1803 and the federal government would have to pursue infrastructure projects. Hamilton's bank was basically an economic expansion project, in which investors would buy national debt through securities. The bank would also be owned by the federal government and private banks, but the federal government would monitor the fiscal activities of the private banks. However, the project was strongly opposed by Thomas Jefferson who claimed that the national government did not have the constitutional right to establish a central bank.

Thomas Jefferson, an Anti-federalist, thought differently than his pro-business counterparts, the Federalists. Jefferson feared business and more specifically, private banks. One of Jefferson's opinions states: "The issuing power should be taken from the banks and restored to the people, to whom it properly belongs" (Jefferson, 2012). He was afraid that the banks would become too powerful and the rights of citizens would be in danger. Jefferson also was skeptical of big government and thought that "My reading of history convinces me that most bad government has grown out of too much government" (Jefferson, 2012). The struggle between state and federal power has been the longest game of tug of war in the United States. When Jefferson opposed Hamilton's bank, he was essentially advocating for a limited federal government.

States were granted the power to authorize charters, a power that the federal government severely undermined. Despite Jefferson's dissent, the economy was expanding rapidly at the end of the 19<sup>th</sup> century with or without the help of the federal government. The invention of the cotton gin in 1793 lowered the cost of producing cotton and more cotton was able to be produced. Influx of cotton into the market created a systemic effect and propelled the growth of the domestic textile industry and urbanization in the North. While one revolution ended, another had begun. By 1800, there were fewer than 50 corporations chartered in the United States and by 1820, 1,200 business were incorporated (Buder, 2009, pp.113). Many of the charters were for companies interested in building public works like bridges, canals, and highways. However, the relationship between the federal government and business would change after the Civil War.

#### A STRAINED RELATIONSHIP: THE GILDED AGE AND PROGRESSIVE ERA REFORMS

After the devastation of the Civil War and the chaos of trying to unify the country during Reconstruction, the Gilded Age began in the late 1860s. The Civil War had destroyed the economy of the South and the industrial North had been strong throughout the war and now the country entered into a unique era of prosperity. During Reconstruction, the country scrambled to put itself back together and ease the tension between the North and the South. The Gilded Age brought America into its industrial revolution that had begun in England a century before. America had everything it needed to develop its

economy: abundant land, ample supply of labor, transportation, and technology. The nation was primed for rapid economic growth and the expanding nation acted as a catalyst.

Behind all of this growth and prosperity were critics; one of the most well-known was Mark Twain, who coined the phrase, The Gilded Age. One the outside was a period of prosperity and wealth, but behind the gleam was corruption, struggle, and inequality. The Gilded Age made many people very rich very fast because of the number millionaires that were produced during this period. In 1892 the *New York Tribune* produced a list of millionaires and calculated that in the years between 1860 and 1890 the number of millionaires rose from less than a hundred to over 400 (Buder, 2009, pp. 124). Famous men such as Andrew Carnegie of Carnegie Steel Company and John D. Rockefeller of Standard Oil redefined business practices. However, there was a price to be paid for economic growth, a social one.

Many of the issues in the Gilded Age are also prevalent today: political corruption, income inequality, debates over social behaviors, and the evils of capitalism. The government had the interests of business in mind because of the railroads. The development of railroads involved a unique mix of private and public investment to promote cross-country expansion. Between1845 and 1860 the government had issued nearly \$90 million in bonds to finance railroad construction and the federal government provided grants of public land to support the transcontinental railroad (Buder, 2009, pp. 108). The railroads were not only financed by the government, but also by Wall Street. Before the Civil War, British companies had bought canal and railroad securities, creating more capital available to build the railroads.

By 1870, the railroads had provided a new method for transporting not just people, but also commodities. However, not everyone was benefitting from the expanding railroads. Even though the system was rapidly expanding, wages of the railroad workers were being slashed. The Great Strike of 1877 against Baltimore & Ohio Railroad ignited a series of strikes across the Northeast. Even though federal troops were called in and ended the strike, it was not a complete failure. In 1890, Sam Gompers and the American Federation League (AFL) advocated for an eight hour workday and fair wages. There were many noteworthy strikes during the Gilded Age, but every time workers opened their mouths, federal troops were called in and brought the strike to a swift end. For example, the Homestead Strike of 1892 at Carnegie's Steel Company in Homestead, Pennsylvania, was caused by a pay cut and the Association of Iron & Steel Workers called a strike. The voices of the unions were not heard over those of big business because strikes were swiftly dispersed by action of the Pinkertons. The government was not help to the cries of industrial workers until Teddy Roosevelt took office and made sweeping reforms, but not before other problems arose.

Political corruption and influence by big business were prevalent in the Gilded Age. In 1904, Lincoln Steffens observed: "We Americans may have failed. We may be mercenary and selfish. Democracy with us may be impossible and corruption inevitable, but...we can stand the truth; that there is pride in the character of American citizenship; and that this price may be a power in the land" (2001, pp. 359). Democracy was on shaky ground and people were critical of their government. In the early 20<sup>th</sup> century, interests groups pioneered new ways of influencing the government through hiring lobbyists, pressuring

government officials, and raising money not just on election day, but whenever their interests were affected (McCormick, 2001, 373). Muckraking journalists exposed corruption by citing that local businessmen bribed legislators and controlled nominations. The new practice of analyzing legislation by lobbyists caused concern among citizens about the influence of business in government policy. The voice of business was controlling politics and eventually the people said enough is enough.

There was a mistrust of business during the Gilded Age because of the disparities it created in society. The Populists and Progressives, the Occupy Movement of the Gilded Age, spoke out against big business and corruption. The Populists, formed by Southern farmers in 1891, were hostile against banks, railroads, and anyone who was part of the "1%." Their platform advocated for government control of the railroads for the common good and a crackdown on banks and trusts. The Populists were vary of the power of money, which "now signified a nonproductive immeasurably wealthy octopus whose long, slimy tentacles reached from private firms on both sides of the Atlantic to grasp every household, business, and seat of government" (Kazin, 2001, pp. 212). Animosity towards big business and corruption were not only brought about by the Populists.

Before Roosevelt was elected president in 1901, a few reforms were passed that asserted the power of the federal government. In 1886, the Supreme Court ruled in *Wabash v. Illinois* that only the federal government could regulate interstate trade, overturning *Munn v. Illinois* (1877). The same year, corporations would benefit from *Santa Clara County v. Southern Pacific Railroad* (1886) because the ruling basically ruled that a corporation was a 'person' with rights similar to an actual citizen like freedom of speech and due process rights. However, government would come down on big business. In 1890 the Sherman Anti-Trust Act prohibited every conspiracy restricting trade and competition. The piece of legislation was to breakdown trusts that had formed like Standard Oil, a monopoly that took over anyone who tried to enter the industry and eventually controlled 90% of the nation's oil.

In 1901, Republican Theodore Roosevelt, 'the Trust Buster,' entered office and brought with him an agenda against big business. In 1902, his administration brought a lawsuit against J.D. Morgan's Northern Securities for violating the Sherman Anti-Trust Act and in 1911, Standard Oil was dismantled by the Supreme Court. The Federal Trade Commission was created in 1914 under Woodrow Wilson and this government agency could investigate companies and stop unfair trading practices. There were many more reforms that passed in the late 19<sup>th</sup> and early 20<sup>th</sup> century. When everything was said and done, the dormant federal government came to life in the late 19<sup>th</sup> century because the voices of the people called for more government. The reforms were created to protect the people, not big business monopolies and trusts. There were many victories for business during the Gilded Age, but at the same time, the federal government undermined the power of business because the people started to voice their concerns. Change had occurred through the government and reform reinforced the government as the dominant power. However, some presidents would be vary of big government and see it as a threat to business.

#### GIVE AND TAKE: THE PRESENT RELATIONSHIP

After the financial crisis of 2008, we as a nation are still feeling the effects four years later. From 2008 to the present day we have seen the federal government take a prominent role in the economy. It has pumped money into the system through economic stimulus, saved the banking system with TARP, and restored security to the economy of America with bailouts. Most of the TARP money has been paid back and economists and politicians are still arguing if the stimulus money aided or hindered the economy. To some, the federal government put its foot down against business and others say that the government only helped the big financial banks and left the citizens out in the cold. However, America has weathered a fierce storm and now it is time to go forward.

A rising issue in the past few years has been executive compensation, which took center stage during the Great Recession. Paul Krugman, a professor at Princeton University and a contributor to the *New York Times* cites in his article, "We are the 99%," that executive are overpaid and even when they fail, they receive millions are they walk out the door (2012). For example, Charles O. Prince III, former CEO and chairman of Citibank was given an exit bonus of \$12.5 million, along with the \$68 million he received in stock and options, a \$1.7 million pension, and a few perks (*New York Times*, 2012). Meanwhile, the market values of Citibank had dropped by \$64 million. Why are executives being paid for failure? It seems easier to just 'try your best' and even if the company fails, a generous parting gift seems fair.

The pressure to perform is more prevalent more than ever and CEO turnover is more common today than it has been than ever before. CEO turnover in the world's 2,500 largest corporation increased from 9 percent in 1995 to 15.3 percent in 2005 because CEOs did not perform to expectations and management changes when stockholders are not happy (Reich, 2007, pp. 76). America's fascination of the stock market was sparked in the 1970s as American corporations globally expanded and today a majority of households own stock. Keeping stockholders happy ensures job security for CEOs so they are willing to do anything to 'hit numbers.' With a variety of stocks to choose from, companies are competing for investors and a competitive advantage.

Corporations are willing to spend money to ensure a fervent voice in Washington's policies through lobbying. In 2011, companies, labor unions, and other interest groups spent a total of \$3.31 billion on lobbying expenditures with the US Chamber of Commerce, a lobbying organization protecting the interests of American businesses, as the top spender with approximately \$66 million (Open Secrets, 2011). In a way the voice of the economic citizen is being heard, but not the voice of the political citizen. Money allocated for lobbying should cause concern because it have been found that the bigger the investment, the greater the return. In a study of 3,209 firms conducted by David Parsley of Vanderbilt College, for every 10 percent increase in lobbying expenditures, company income rose by more than a one-half percent, which meant millions of dollars for larger companies (Addison, 2012). However, companies do not only spend money on lobbying to raise revenues, but also to safeguard themselves from competition and market forces.

Whenever an industry or company feels threatened by a piece of legislation, they will pour money into lobbying so their interests are protected. For example, "In the decade leading up to the financial collapse, 1998 to 2008, the finance, insurance, and real estate industries spent a total of \$5.18 billion to influence Congress and the White House, including \$3.44 billion on lobbying fees." In the fall of 2008, President Bush signed into law the Troubled Asset Relief Program or TARP, which granted \$700 billion to financial banks, automakers, and insurance companies. Citibank, Bank of American, and A.I.G received \$50 billion, \$45 billion, and \$70 billion respectively (Erikson, He, and Schoenfeld, 2012) and most of the bailout money has been paid back, but the bailouts marked a new relationship between government and business. The government propping up failing banks only led to intensification of the moral hazard problem. The financial crisis initiated new debates about the notion of 'Too Big to Fail' and whether the government has a responsibility to save failing companies.

Concerns about corporations contributing funds to candidates arose in 1971, when Congress passed the Federal Election Campaign Act (FECA). This piece of legislation was designed to create more transparency when it came to donations and required candidates to report contributions. Also the Revenue act set up a Presidential Election Fund, which provided funds to candidates to cover campaign expenses. In exchange for the public funds, the candidate would not collect private donations. However, Congress would amend the conditions to simply limit private donations for public funds. The Federal Election Commission (FEC) was also established as part of the Federal Election Campaign Act.

In 2010, the split ruling in the landmark case of *Citizens United v. Federal Election Commission* (2010) gave corporations the right spend money from their treasuries on electronic communications whenever they wanted in the course of an election season. The ban on corporate expenditures in elections was deemed unconstitutional because it violated First Amendment rights. President Barack Obama noted the ruling as "a major victory for big oil, Wall Street banks, health insurance companies and other powerful interests that marshal their power every day in Washington to drown out the voices of everyday Americans" (Liptak, 2010). With corporations being granted freedom of speech through the First Amendment, the line between 'person' and American citizen is fading. During the 2008 campaign, Obama did not utilize public funds and elected to raise money through private donations, but he managed to raise \$335 million in individual donations under \$200 (FEC, 2009). The 2008 presidential election was just one example of how the voice of the American citizen was still alive and well, but that voice would be tested during the next presidential election.

Ever since the ruling in *Citizens United* (2010), Super Political Action Committees or Super PACs, have changed campaign finance and the 2012 presidential race. Super PACs are organizations, independent of a candidate, allowed to raise unlimited funds from corporations, unions, special interests groups, and individuals in favor of or against a certain candidate. Super PACs are required to reports the funds they receive, but they are not allowed to directly donate funds to candidates. So why are Super PACs a problem? One criticism of Super PACs is that they can raise unlimited funds from the super rich and corporations.

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When one looks at the breakdown of the numbers, the situation is not as bleak and corrupt as people think. The Super PAC, Restoring our Future, which endorses Republican presidential candidate Mitt Romney, has raised approximately \$43 million, but Priorities USA Action, which endorses presidential incumbent Barack Obama, has raised only about \$6.5 million (Open Secrets, 2012). The more money a Super PAC has the more money it has to spend on supporting or opposing a candidate through campaign ads, fundraisers, and the like. Super PACs are outrageous because they offer an avenue for corporations to donate funds to a campaign without actually donating to a campaign. Corporations have a stronger voice in elections and this drowns out the voice of the average citizen who can actually vote. With corporations having such a strong foothold in Washington, how can citizen reclaim their voice to overpower business? The answer lies in how society perceives corporations.

#### **CONCLUSIONS: RECLAIMING THE VOICE OF THE CITIZEN**

From the pro-business agenda of the Federalists, to the rise of the influence of corporations in Washington today, the evolution of American business has come a long way, but unfortunately some problems have developed leading to anxieties about the future of democracy. The American citizen has turned into the American consumer and stockholder. As citizen's we have to learn how to balance political and economic freedoms. We have the ability to vote, corporations don't. Even though *Citizen's United* basically granted rights to corporations that does not mean they are people. Just because corporations are made up of a group of people does not mean they are people. The notion of corporate personhood needs to end and corporations should only exist as a legal entity and not a natural person.

No matter how many restrictions are placed on lobbying practices, the involvement of business and special interest groups in government policies still exists. The restrictions have not been able to keep up with the evolution of lobbying practices because lobbying has become more complex and organized. At the heart of the controversy lies the freedom of speech argument. It has been interpreted that lobbying is protected by the First Amendment of the Constitution, but lobbyists offer a skewed perspective usually from a minority, not the majority. There are exceptions to the First Amendment and limiting freedom of speech has been done before through legislation.

Campaign finance reform also needs to be completely overhauled. Corporations should not be allowed to donate any amount of funds by any means. They can't vote so why should they be allowed to donate money to a Super PAC? The reason why people were drawn to Obama in the 2008 election was he raised a considerable amount of money through smaller donations. The reason why Obama elected to not receive public funding for his campaign was that he wanted to raise enough money if his campaign was attacked by fellow candidates. Making more public fund available to candidates would be ideal, but people would be up in arms about their taxes going to a candidate they do not support. That leaves private donations by citizens and corporations are not citizens. The solution to the problem is to do away with corporate donations. The democratic process should be at work during elections, not corporate influence.

The government should not leave business to its own devices, but too much intervention is dangerous to the free market principle championed by Adam Smith. The role for government should be to limit barriers to entry, limit market concentration by rejecting 'too big to fail,' and reestablish regulations that promote the common interest while fostering business as well. People are calling for change through grass roots movements like Occupy Wall Street and the Tea Party Patriots. This attention and media coverage of these two movements indicates that the voices of Americans are still alive and well. Also many interest groups have come out of the woodwork to oppose or advocate for the Patient Protection and Affordable Care Act or Obamacare in light of the Supreme Court hearings questioning the constitutionality of the legislature.

In his speech at Madison Square Garden on the eve of the 1936 election Franklin Delano Roosevelt said, "We know now that Government by organized money is just as dangerous as Government by organized mob" (UCSB, 2012c). The Great Depression had severe economic effects that were unlike the United States had seen before. All of the promise of the American dream was crushed by the crash of the stock market and reckless business was to blame. Roosevelt's words ring true today and unfortunately, money has flooded politics. The government does not need to course correct every time there is an economic downturn, but it should pay attention to the needs of its citizens before the needs of business.

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# **Does History Repeat Itself: Financial Crises**

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#### ABSTRACT

Financial downturns have occurred nearly every 13 years. These downturns are part of a pattern known as the business cycle. There were two major standouts of these financial downturns: the Great Depression and the financial crisis of 2008. These crises were atypical in their scale, magnitude and reach. Although, these two crises share similarities in cause and mechanism, it is important to note that financial crises are not a construct of modern times. Financial crises have occurred for centuries and this study aims to highlight financial crises of the past and apply lessons learned from these to present times.

#### METHODOLOGY

The following methodologies were used: historical review, analysis, synthesis, induction, deduction, comparison.

#### INTRODUCTION

The financial crisis of 2008 is heralded as the worst global crisis the world has faced since the Great Depression of the 1930s. The impact of the crisis is astounding and its effects are still being felt. Stock prices are one indicator of how harsh the financial crisis of 2008 was. Before the collapse, the Dow Jones Industrial Average index peaked on October 12, 2007 at 14,093.08 and plummeted to as low as 6,626.94 (Google Finance, 2012) which represents a drop of nearly 53%. During the Great Depression, the Dow Jones Industrial Average faced a similar collapse going from a peak of 381.17 on September 3, 1929 to a low of 41.22 on July 8, 1932 (Rosenberg). To see the impact of the financial crisis of 2008 in terms of dollars we look to its impact on financial institutions across the globe. IMF forecasted that United States and European banks would lose over 2.8 trillion dollars in toxic assets in the period of 2007-2010 (Reuters, 2009). This impact was not just felt in financial institutions but also hit families from all income brackets. Unemployment in the US doubled from 5% on January 2008 to as high as 10% on October 2009 (U.S. Bureau of Labor Statistics, 2012). This impact was also felt in the pockets of the average American family. The net worth of Americans fell by 25% during the crisis (Singh & Bruning, 2011).

The financial crisis of 2008 had an extremely detrimental impact across the globe and it is the goal of economists to better understand what happened and to prevent such a serious collapse from happening again. To prevent such a collapse first we must understand it. There are many theories as to why collapses happen but one leading theory that is commonly accepted is the concept of business cycles.

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Historical data shows that in the last century, the United States economy has experienced ups and downs (Krugman, 2009). This pattern is known as the business cycle and is sometimes referred to as the boom and bust cycle. The latter term better illustrates the nature of the ups and downs the economy experiences. This pattern of boom and bust is evident when looking at the economy in the short term. There are periods of growth and there are periods of decline. In the long term, however, there is a steady upward trend. Thus if we compare the real GDP of the US to the real GDP from 50 years ago there will be a marked increase. If we look closer at this period, we will notice that there are periods of downturn where real GDP decreased such as in the early 70s, early 80s, early 90s and most recently in the last four years.

Periods in which real GDP, output and employment fall for many industries are known as periods of recession. In the past century the United States has faced at least one recession every decade. Each recession varies in length and magnitude of economic contraction. During periods of growth the economy is said to be in an expansion. These periods are characterized by growth in real GDP, industrial output and employment. The turning point between a period of expansion and recession is known as the business cycle peak. The turning point between a period of recession and expansion is known as a business cycle trough or saddle. A recession is typically defined as the reduction of GDP for two consecutive quarters (Dzikevicius & Zamzickas, 2009). The U.S. National Bureau of Economic Research is a research organization that reviews economic data and determines if the country faced a recession and determines the dates that we entered and exited a recession. According to the U.S. National Bureau of Economic Research the United States most recently entered a recession in December 2007 and it lasted eighteen months ending in June 2009 (National Bureau of Economic Research, 2012). Similar to how negative changes in GDP indicate a recession, positive changes in GDP indicate periods of expansion. Table 1 shows all official expansions and contractions as reported by the National Bureau of Economic Research.

There are competing theories explaining why the economy experiences these periods of expansion and recession. One of the leading theories is the Austrian business cycle theory. The Austrian theory begins with the central bank or in the case of the United States, the Federal Reserve and its monetary policy tools. When the Federal Reserve artificially cuts interest rates as it did prior to the financial crisis of 2008, it makes entrepreneurs and investors falsely believe that consumers are willing to delay consumption and save more. The natural interest rate, which is the interest rate if the Federal Reserve did not engage monetary policies, is the rate that lenders must pay to consumers to convince consumers to delay consumption. This monetary policy of lowering interest rates creates excess credit and causes wages and prices to go up. As this increased money from the excess capital comes down to consumers, the consumers' preferences haven't changed (the natural interest rate hasn't changed). Thus, there is no increased demand for this excess supply of goods. The Federal Reserve realizes that such growth cannot be maintained and thus increases interest rates. Markets begin to feel the credit crunch and then the excess supply of goods and poor investments is liquidated. The liquidation is then followed by a recession, which brings the economy back to its original balance (Dzikevicius & Zamzickas, 2009).

Financial crises lead to devastating effects such as reduced GDP, lower employment, lower wages, decreased investment and decreased production. The primary goal of economists and specifically the Federal Reserve is to not only reduce the effects and length of recessions but also to potentially eliminate them. In order to better realize this goal we will look at past financial crises and compare them to the crisis the United States faced in 2008. By looking at the similarities and differences and comparing them to the Austrian business cycle theory and other related theories we can be better equipped to avoid further financial crises.

#### **DUTCH TULIP CRISIS**

The Dutch tulip crisis is one of the earliest recorded and studied crises to plague an economy. It is more commonly known as Tulip Mania. In short, the tulip crisis was a period during the Dutch Golden Age when tulip bulb prices rose so high that they cost as much as a house (Hirschey, 1998). The Dutch Tulip Crisis began in 1593, when Conrad Guestner imported the first tulip to Holland from present day Turkey. The tulip fascinated the Dutch and it quickly became a status symbol to own one. This quickly elevated the price of the tulip. The price rose dramatically again when the tulip contracted a virus typically known as the mosaic virus. The mosaic virus adorned the tulip petal with beautiful strips of color that gave it a flaming look (See Figure 5). At first, people bought the bulb for its beauty, but its quickly rising price attracted investors who bought the bulbs and sold them at a higher price. This further fueled the price increase and tulip prices continued to soar. Tulip mania spread across the Dutch lands and what was once a symbol of status for the rich became an investment tool for the middle class.

Tulip mania continued to spread beyond the middle class and into stock exchanges. Tulip bulbs were being traded in the Amsterdam, Rotterdam, Harlem, Levytown, and Horne stock exchanges (Ubhan, 2007). This opened up the opportunity for speculators to trade options on the tulip bulbs. Options trading allowed people to speculate on the price of tulips by investing only a fraction of the cost of what a tulip bulb actually cost at the time. Just like the housing market saw a steady price increase in the early 2000s, tulip prices were going up steadily and few thought the price would ever go down. The tulip craze was a growing bubble that was ready to pop just as the housing bubble popped and resulted in a financial crisis.

The tulip bubble couldn't grow any larger and it did pop indeed. The Dutch government realized that the bubble was growing and they began to implement regulations. Savvy investors realized that the bubble couldn't grow anymore and they began to liquidate their investments. This increased the supply of tulips on the market, which drove prices down. Prices were further driven down as people began to plant the bulbs to grow more bulbs. Tulip prices began to fall slowly and then the suddenly collapsed. In less than six weeks, the price of tulips fell 90% (Ubhan, 2007). As the tulip market crashed, the Dutch government decided not to intervene. As the tulip market crashed, it affected the entire Dutch economy and Holland faced a severe crisis that lasted for decades.

The Dutch tulip crisis has many connections to the most recent financial crisis and there are many lessons that should have been learned and implemented prior to the crisis. Similar to the financial crisis of 2008, the Dutch tulip crisis was a speculative crisis. As speculators began to invest in tulip bulbs, the price quickly rose and did not reflect the actual value of tulips that buyers would pay. Risky investment tools further exacerbated the problem. Options trading meant that investors could invest in tulips at a fraction of the cost of a tulip bulb. This is similar to how banks convinced the SEC prior to the 2008 crisis to allow them to take on greater debt to make more investments. This increased debt puts more at stake and thus the eventual crisis would be deeper and more protracted. This is what we saw with the financial crisis of 2008, which lasted 18 months, significantly longer than any of the last financial crises after the Great Depression. This is also what happened after the Dutch tulip crisis, which saw the markets affected for decades by the sudden collapse of tulip prices.

#### THE LONG DEPRESSION, CRISIS OF 1873

The Long Depression was originally known as the Great Depression until the 1930s when the Great Depression took that name. The Long Depression is the longest recorded recession in US history. It lasted 65 months, nearly two years longer than the Great Depression, which lasted 43 months (National Bureau of Economic Research, 2012). The Long Depression is also one of the first modern international crises as it affected economies around the globe.

The Long Depression has a long history that begins in Europe. In the 1860s, European banks began mortgage backed lending programs. This led to a housing bubble where beautiful homes in Vienna, Berlin, and Paris were built and sold. In 1873, defaults on these properties began to restrict lenders and these banks began to call back their loans. European banks called back loans from British banks and they in turn called back loans from American clients. At the time, these American clients consisted largely of railroad companies (Cuzron, 2009).

Before discussing the effects of these loan callbacks, we turn to the situation of railroad companies in the United States. The railroad industry was a booming bubble at the time, just like the recent housing bubble and the Dutch tulip bubble. There was heavy investment and speculation in railroads. In the period of 1868 to 1873, 33,00 miles of railroads were added to the US (Richardson, 2007). This heavy growth in the railroad industry attracted many investors. At the peak of the industry, the railroad companies accounted for nearly half of the employment in the US, eclipsing agriculture. Railroad companies were building a plethora of railroad docks and laying down new track with no immediate monetary award in sight. Speculators fed into this frenzy and further enlarged the railroad bubble.

Elsewhere, another important set of events was occurring. In 1871, the German empire decided to stop minting silver coins. This led to a dramatic drop in the global demand for silver. At the time, the US was a major producer of silver. As a result of this German policy, the US enacted the Coinage Act of 1873, which moved the US to a gold-only standard. This act had the immediate effect of decreasing the

value of silver but it also had a longer-term effect that decreased the money supply in the US (Scott, 1952).

Large speculation in the railroad industry combined with decreased money supply and the European call back of the loans led to the panic of 1873. The panic of 1873 ignited with the failure of Jay Cooke & Company. Jay Cooke & Company was a bank that was heavily invested in the unrealistically booming railroad industry. Cooke's firm was responsible for raising \$100 million in capital for the Northern Pacific Railway. When they were unable to raise this money the bank collapsed and eventually declared bankruptcy. This led to the protracted recession that lasted 65 months. More railroad companies began to fail because they couldn't pay back the loans that the Europeans were demanding and this led to other US banks collapsing. As the railroad industry declined banks collapsed and unemployment increased. Unemployment reached as high as 14% in 1876 (Lee, 2008). The collapses had far reaching effects. Many industries suffered and faced decreased output.

The financial crisis of 1873 has many parallels to the financial crisis of 2008. The most obvious parallels are the growing bubbles. In the Long Depression, there was a European housing bubble and a railroad bubble. These are similar to the housing bubble that the United States faced in the early 2000s. There was over investment in the European housing market and the railroad industry. Over investment led to speculation and risky investment. This sets up the ideal situation for a collapse. The most disturbing fact from this historical example is how closely it resembles what happened in the last few years. The European housing bubble that was growing in the 1860s mimics what was happening in the US in the last decade. Regulators and lawmakers from today should have been more aware of the impending collapse given the parallels to what happened over a century ago.

#### THE GREAT DEPRESSION

The great depression is the most severe worldwide economic depression in modern times. It is the longest depression that the United States has faced in the twentieth century (National Bureau of Economic Research, 2012). Historians typically mark the beginning of the Great Depression as October 29, 1929 or Black Tuesday. This day was marked by a sudden collapse of US stock market prices. In order to better understand how to avoid recessions we must discuss the events leading up to this day and the aftermath of this day.

Before the collapse on Black Tuesday, the stock market was doing extremely well. In fact, the 1920s are also known as the Roaring Twenties. The 1920s was a time of wealth and excess. This was especially noticeable in the way that people were investing. Just like many believed that the housing market would continue to rise in the early 2000s, people in the 1920s believed that the stock market was going to continually rise and during the twenties this was true. The stock market witnessed a meteoric rise in the 1920s increasing in value five-fold in six years (PBS). The Dow Jones Industrial Average peaked on September 3, 1929 at a high of 381.17. This meteoric rise was fed by over speculation in the stock market.

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Because of the great confidence in the stock market, Americans were buying stocks in drove and worse, they were buying stock with credit. This was known as margin buying. People would buy hundreds of dollars of stock with little investment on their part. Politicians were unaware of the economic situation and thus did nothing to control over speculation and margin buying. With all this uncontrolled speculation, the stock prices rose so rapidly that the stock prices no longer truly represented the health of the industries that they were backing. In the month prior to Black Tuesday, there was some volatility in the market just after the market peaked. On October 24, 1929, a record 12 million shares were bought and sold which caused a collapse in stock values. The following Tuesday a new record 16 million shares were put on the market and caused stock values to plummet. Just like speculation in the housing market led to the most recent financial crisis, speculative investing in the stock market led to the Great Depression.

These are the key events leading to the stock market crash of October 29, 1929. The resulting depression escalated because of a number of factors. One factor was the large amount of wealth lost in the stock market. Over the course of the depression, the stock market declined in value by \$40 billion. This directly affected investors but it eventually led to the failure of banks. As banks continued to fail, people not involved in the stock market also lost money as their savings accounts were wiped out.

The government was supposed to do something. After the crash of 1907, the US government set up the Federal Reserve. The Federal Reserve was supposed to mitigate the effects of the crash and bring the economy back. At the time the Federal Reserve decided to cut the money supply. Over the course of the depression they cut the money supply by 1/3 (Kepelian, 2008). This was the exact opposite of what they should have been doing. Banks needed more money at this time but this poor policy decision cut the money supply which led to an exponential growth in bank failures, further wiping out the savings accounts of Americans. Fortunately, the Federal Reserve has learned from this mistake and has implemented better policies after the financial crisis of 2008. After the crisis, the Federal Reserve slowly dropped the federal funds rate to 0% which helped increase the money supply and prevented banks from failing.

Let us review the parallels of the Great Depression to the recent financial crisis of 2008. Both of these crises were led by speculative spending. The Great Depression was led by speculation in the stock markets and the financial crisis of 2008 was led by speculation in the housing market. At both times, the government did little to stop or curb the over speculation. In retrospect, the government should have enacted policies controlling margin buying in the 1920s and more recently the government should have put a stop to sub-prime mortgages. Preventing over speculation is a key lesson learned from these two financial crises.

#### **THE FINANCIAL CRISIS OF 2008**

The most recent financial crisis is described as the worst financial crisis to have occurred since the Great Depression. Millions of jobs were lost and trillions of dollars in the market disappeared (Friedman & Friedman, 2009). Looking at this crisis retrospectively, the primary cause of the crisis was the prevalence of sub-prime mortgages followed by the inevitable inability of Americans to pay back these mortgages.

Behind this primary cause there were many factors at play that led to the eventual collapse: the selfinterest of executives, the flawed bonus system the lack of regulation, and the inaction of credit agencies.

We will begin by looking at the first two factors at play. It is obvious that executives were eager to make money and combined with a flawed bonus system, executives did anything to make a big bonus. Bonuses were awarded based on annual income and if executives were able to generate a large income on paper they were rewarded heavily. This didn't apply to just executives but all top tier workers. In 2006, Wall Street bonuses totaled a record breaking \$24 billion (Farrell, 2006). This encouraged executives and employees to take big risks to score big bonuses. One risky method was the selling of sub-prime mortgages. Executives encouraged employees to give out as many mortgages as possible. Many of these mortgages were given out with little or no down payment. The prevalence of sub-prime mortgages sky rocketed prior to the financial crisis of 2008 (See **Error! Reference source not found.**).The immediate result was an increase in income on paper and thus an increased bonus for the year. Few were aware of the fallout that was about to result and no one did anything to prevent it.

This leads to the next factor at play - lack of regulation. In 2004, five top investment banks pushed the United States to grant an exemption from the net capital rule which would allow them to take on a greater amount of debt. With this increased debt banks would be able to invest in these risky mortgages and credit default swaps. These regulations were first put in place to prevent such risky investments and these banks worked to reverse these preventative measures. Furthermore neither the Federal Reserve nor the US Government took action to prevent banks from making poor investments into risky mortgages. In fact, the Federal Reserve kept the federal funds rate low during the early 2000s. This action increased the monetary supply and gave the banks more money to make risky investments. Many blame former Federal Reserve Chairman, Alan Greenspan, for the financial crisis of 2008. He was a chief promoter of low interest rates and deregulation in the 2000s which led to over speculation and the eventual crisis that followed (Time Magazine, 2009).

Credit Agencies were also to blame. They were responsible for rating the complex packages of subprime mortgages and credit default swaps. They should have lowered the status of these packages because of the high risk involved but they gained heavily from rating these packages favorably. They would collect multimillion dollar fees for rating these complex packages and thus they continued giving high ratings which gave false confidence to the banks that bought and sold these packages. Their high ratings also meant that there was little warning to the impending collapse. If the credit agencies did their job then these packages would have not been valued as high as they were and there would be less speculation in the sub-prime mortgage market.

#### WHAT DO WE DO NOW

This study has highlighted some of the major financial crises that have plagued our economy and from these crises there are many lessons to be learned. Each of these crises has one important trait in common – over speculation. In the Dutch tulip crisis, there was extreme speculation in tulip bulbs which

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drove the price of tulips up. In the Long Depression, there was over speculation in the train industry. In the Great Depression there was over speculation in the stock market. Most recently, in the financial crisis of 2008, there was over speculation in the housing market. Given the recurring trend, it seems like investors, bankers, regulators and the government have not learned an important lesson - stop speculation before it goes rampant. The actual situation is more nuanced. The government and regulators have already put policies into place to prevent over speculation and to prevent the worsening of recessions. After the financial crisis of 1907 the United States created the Federal Reserve. There are also other bank regulations such as capital requirements, reserve requirements, corporate governance, financial reporting, disclosure requirements, credit rating requirements and others. More recently the United States implemented the Dodd-Frank Wall Street Reform and Consumer Protection Act. All these requirements and acts are supposed to prevent deep and retracted recessions from occurring but crises seem to continue to occur regardless. One reason for this is that bankers' and executives' greed finds new and innovative ways to make money that bypass current laws and regulations. This is evident from looking at the past financial crises highlighted in this study. Although all the crises have over speculation in common, in each case there was over speculation in a different area. Investors, bankers and executives find new avenues to make money and this leads to over speculation.

Clearly regulators and the government must act to stop over speculation and they must do so in a way that prevents over speculation in all possible fields. At the same time regulators must not go so far as to restrict the economy. This is a delicate balance with no clear answer available. What is clear, however, is that over speculation must be prevented. Regulation tools must not just target one form of speculation but must they must also be innovative and far reaching so that they catch unsuspected forms of speculation. Furthermore, regulators must be savvier and prepare to catch speculation bubbles before they grow too large and lead to a downfall.

Practical policy tools that should be implemented include strict enforcement of debt ratios, credit reporting and compensation oversight. Implementing these rules will prevent risky investments. With strict enforcement of debt ratios, banks will only be allowed to maintain a certain amount of debt on their statements. This means that they will have to use more of their own money to make investments and thus they will be less likely to make risky investments. Moreover with proper credit reporting, financial packages and industries will be rated according to their actual value and excessive hype in an industry will be slowed before it grows too large. In addition, compensation oversight will prevent executives from pushing risky investments in order to benefit themselves in the short term. Executives should be held liable for future losses and they can be penalized by retraction of bonuses from previous years.

These tools are practical measures that can be set up now to prevent severe financial crises. Beyond these measures, the government and regulatory agencies need to constantly be on the lookout for innovative techniques used by executives and bankers. Regulatory agencies need to be aware that bankers and executives will find ways to bypass the system and thus these agencies must be at the ready.

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We must always remember the financial crisis that have plagued the US and international economies in the last few centuries. Keeping these in mind we can prevent future crises from happening again.

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# An Examination of the Resource-Based Horizontal Acquisition Strategy of JBS – the Biggest Meat Packer in the World

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#### ABSTRACT

This paper presents a longitudinal study of the resource-based horizontal acquisition strategy of JBS. This strategy transformed a relatively small business that was founded in 1953 (comprising a butcher shop and small slaughterhouse located in a small town in the interior of Brazil) into the world's biggest meat producer by 2010. However, the acquisition strategies of the company is not one dimensional, it changes with times and the maturity of the company. We further discuss the lessons learned from the growth strategies.

### INTRODUCTION

This paper examines the successful resource-based horizontal acquisition strategy of JBS. This strategy transformed a business that was founded in 1953 by José Batista Sobrinho in a small town in the interior of Brazil (comprised of a butcher shop and small slaughterhouse) into the world's biggest meat producer by 2010.

The history of JBS can be divided into three periods: in the first period (1953–2006), JBS spurred its growth by horizontal acquisitions in Brazil, and first international horizontal acquisition in Argentina; in the second period (2007–2008), JBS became a public company with an initial public offering (IPO) of JBS and pursued aggressive international horizontal acquisitions that started with the acquisition of Swift in the U.S.; and finally, in the most recent third period (2009–2010), it merged with Bertin (the second largest meat producer in Brazil to JBS at that time) and diversified into the unrelated businesses of Bertin as well. In addition, with the acquisition of Pilgrim's Pride in the U.S., it also diversified into the poultry business. Finally, the paper evaluates the resource-based horizontal acquisition strategy of JBS and the role of the Brazilian Development Bank in financing the growth of JBS.

#### THE EARLY YEARS

In the early 1950s, José Batista Sobrinho started a small business purchasing cattle to resell to slaughterhouses in the city of Anápolis (the third largest city in the Brazilian state of Goías: with a population, at the time, of approximately 50,000 inhabitants). The business grew, and in 1953 Sobrinho opened—with his two brothers—a small butcher shop and slaughterhouse, which slaughtered five heads of cattle a day. The construction of Brasilia in 1956 (only 162 kilometers from Anápolis) promoted strong

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economic growth in the region during the 1960s. Sobrinho took advantage of this growth, and of the tax exemption offered to companies that were willing to invest in the new capital of Brazil, and his company, Friboi, made its first acquisition of an slaughterhouse in Planaltina (a satellite town of Brasilia) in 1968 (Bell & Ross, 2008; Salomão, 2009).

Brazil's strong economic growth in the 1960s and 1970s increased the country's beef consumption, and the business prospered. In 1970 Friboi acquired a new slaughterhouse in Luziânia (also in the state of Goiás). With this acquisition Friboi increased its slaughtering capacity to 500 heads of cattle a day. During the 1980s, Friboi invested to expand its processed beef production capacity, and in the 1990s and early 2000s the company began expanding aggressively, acquiring slaughterhouses and increasing its capacity for producing fresh, chilled, and processed beef in Brazil. Between 1993 and 2005, Friboi acquired twelve slaughterhouses and beef processing plants, and so became one of the largest beef producers in the country, with a slaughtering capacity of 5,800 heads of cattle a day.

Sobrinho's three sons (José Jr., Wesley, and Joesley) chose to work in the company rather than attend college. They started in the slaughterhouses, on the beef cutting room floor: however, from 2000 the sons took over the day-to-day management and high level strategic decisions, while their father (aged 80 in 2012) stepped back to play an advisory role (Bell & Ross, 2008). Today, Joesley serves as Chairman, Wesley as CEO, and José Jr. and the patriarch Sobrinho serve as board members.

The first international expansion by Friboi was made in 2005, with the acquisition of Swift, Argentina's largest beef producer and exporter, and was financed by the Brazilian Development Bank (BNDES). In the same year, Friboi was reorganized from a closed family business to a public company, and was renamed JBS SA, after the initials of the founder José Batista Sobrinho (JBS).In 2006, the newly renamed JBS increased its slaughter capacity to 22,600 head cattle a day (from the previous 5,800), by acquiring two additional slaughterhouses and beef processing plants in Argentina. With these two additional plants JBS had twenty-one beef processing plants in operation in Brazil and five in Argentina. The acquisitions in Argentina were probably motivated by the substantial strength that the Brazilian currency (the real) had against the U.S. dollar in 2006, making foreign acquisitions relatively inexpensive. This strength of the real, on the other hand, put Brazilian exporters in a disadvantage: it presented a challenge for JBS, who exported more than a third of its beef and generated sixty-one percent of its sales through exports to customers in 110 countries even through major international markets were closed to Brazilian beef, including the U.S., Canada, Mexico, and Korea (Bell & Ross, 2008).

#### IPO AND THE ACQUISITION OF SWIFT IN THE U.S.

In March 2007, JBS became the first beef processing company to make an initial public offering (IPO) on the Brazilian stock exchange, raising almost US\$800 million. In addition to acquisitions of both slaughterhouses and beef processing plants in Argentina and Brazil in the first half of 2007, in July of 2007 JBS surprised the market by acquiring Swift, with operations in the U.S. and Australia, for a total amount of US\$1.46 bil. (Bell & Ross, 2008).

A substantial portion of the financing for the acquisition of Swift was obtained by JBS from a capital increase from the Brazilian Development Bank (BNDES) in exchange for a portion of the new common shares. Prior to the deal, JBS had a market capitalization of \$4.2 bil. and sales of \$2.1 bil.: almost five times less than Swift's sales of \$9.5 bil. (Salomão, 2009).

Throughout the remainder of 2007, JBS made other major national and international acquisitions of slaughterhouses, beef packing plants, and industrial plants in the areas of the beef byproduct market segment and of packaging for JBS products. With these acquisitions, the total of the slaughter capacity of JBS rose in 2007 to 51,400 heads of cattle a day from 22,600 in 2006. The number of plants also increased from 26 in 2006 to 50 plants in operation at the end of 2007.

Prior to the acquisition of Swift, JBS had a stellar growth record, which helped promote the IPO and capital increase in 2007. From 2004 to 2006, sales rose by 21%, with net income increasing from \$50.2 mil. to \$84.3 mil. The ebitda of JBS, as a percentage of revenue, was: 9.1% in 2004, 9.6% in 2005, and 14.2% in 2006 (the year that the appreciation of the real against the dollar reduced exports of Brazilian beef)(see Table 1). These percentages were be far greater than those of other major players in the U.S. beef processing industry. On the other hand, JBS also held a high debt load (\$956 million) at the end of 2006 (Bell & Ross, 2008).

#### **TABLE 1: JBS Operational Performance**



With the acquisition of Swift in the U.S., JBS became the third largest beef processor in the U.S. (behind Tyson and Cargill), and the largest worldwide, with holdings in the U.S., Australia, and Europe, as well as Brazil and Argentina. The rationale for the acquisition of Swift by JBS was the importance of establishing operations in other regions besides Latin America, as this allowed JBS to deal more effectively with the currency fluctuations, and to better manage sanitary restrictions and other trade barriers (Bell & Ross, 2008).

In December 2007, JBS announced the purchase (completed in 2008) of 50% of Inalca, the absolute leader in the Italian beef industry and one of the largest producers of beef products of the European market, with operations in Russia, Africa, and Europe. The acquisition, at a cost of Euros 225 million, represented a strategic alliance: this created important synergies between products and selling channels, introduced JBS products to key markets throughout Western Europe, and brought Inalca (now Inalca-

JBS) into closer contact with the world's main beef suppliers. For JBS, the acquisition represented an important initial step for the company's future growth in the European market.

#### **RESTRUCTURING AND DIVERSIFICATION**

In August 2009, JBS entered a new area with the creation of JBS Couros (Leather). The entry into leather was a logical step, since JBS was the largest producer of beef, and leather is a byproduct of this industry. By December, JBS also merged with Bertin, the second largest beef packer in Brazil and one of the largest beef exporters in Latin America. The merger with Bertin—besides reinforcing the market share of JBS in beef packing and leather—diversified the company into areas of prepared foods, pet foods, milk and dairy products, recycling, biodiesel fuels, petrochemical products, personal hygiene and beauty products, collagen, and canning, among others. With the merger, the slaughter capacity of JBS increased to 90,290 heads of cattle per day (from 65,700 in 2008). In addition, because Bertin was the largest Brazilian producer and exporter of leather, the merger the merger made JBS the largest leather producer and exporter in the world.

In the same month as the merger with Bertin, JBS made another diversification by acquiring 64% of Pilgrim's Pride Corporation (PPC) and thereby entering into the chicken-processing market. With this acquisition, JBS became the second largest poultry producer in the world, with operations in the United States, Mexico and Puerto Rico, and a daily slaughtering capacity of 7.6 million chickens. To finance the acquisition, JBS issued convertible debentures that were subscribed by the Brazilian Development Bank (BNDES). The same month also saw the company announced the acquisition of Tatiara Meat Company (TMC), located in South Australia. The completion of the acquisition occurred in February of 2010.

#### **CONSOLIDATION PAINS OF JBS**

During 2010, JBS made numerous efforts to resolve pending issues between the partners of Inalca-JBS, in which JBS had acquired a 50% interest in December 2007 for Euros 225 mil. Finally, a termination agreement to dissolve the partnership was signed: through this agreement the Cremonini group paid Euros 218.9 mil. euros to purchase the 50% interest of the company from JBS. Also in Italy, JBS acquired outright control over Rigamonti, in which it had held a 70% interest since December 2009.

The many acquisitions landed JBS with \$6.9 bil. in debt, and some market analysts during 2010 expressed concern that the company was overreaching. The firm lost \$160 mil. in 2010 on about \$33 bil. in sales, mainly because of the cost of integrating Pilgrim's Pride and Bertin. As investors became worried, JBS' stock dropped by 30% during 2010. Other meat producers, including the main rival of JBS, Tyson Foods, also had income difficulties during 2010, mainly because of spikes in corn prices that increased the costs of raising cattle (Blankfeld, 2011).

In response, JBS management decided to postpone the initial public offering of its America subsidiary, JBS U.S., which was scheduled for December 2010 and already registered with the SEC. The initial public offering was required, because the indenture of the debentures issued in December

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2009 and subscribed by the Brazilian Development Bank (BNDES) had the obligation to make them convertible into sponsored Brazilian Depository Receipts (BDRs) that were backed by US shares held by JBS. The deadline for this conversion was December 2010, and in the event of postponement, JBS had agreed to pay a premium of \$300 mil. to the debenture holders as compensation, in accordance with the rules set in the indenture.

In December 2010, management decided that JBS would pay the premium and postpone the IPO to December 2011 (Economia, 2010). In April 2011, the management of JBS announced that they had cancelled the plans for the IPO of its American subsidiary JBS U.S., ignoring the obligation to its main debenture holder BNDES (Olivon, 2011). This decision was undoubtedly motivated by the poor performance of the company shares, which continued the downward trend that had commenced in 2010. In May 2011, the debenture holders, including BNDES, converted their debentures into JBS shares (Gradilone, 2011).

### FINANCIAL PERFORMANCE OF JBS

The performance of JBS after the 2007 IPO never met shareholders' expectations, and this is reflected in the poor performance of the company shares. The prospectus for the IPO showed that its ebitda is about 14% of sales. To the disappointment of the investors, with the acquisition (in 2007) of Swift in the U.S, JBS had incurred a significant loss in the first year after the IPO, and its ebitda as a percentage of revenue never met shareholders expectations (see Table I above). As a result, JBS shares have underperformed ever since: from the IPO in 2007 to April 2012 the growth of JBS shares was only 4.75%, compared with the Brazilian stock exchange index's growth of 37.37% in the same period.

On the other hand, the status of JBS as a diversified global protein producer allowed the company to navigate the market in a way few others could. In 2008, for instance, when the European Union restricted sales of Brazilian meat (alleging that breeders weren't complying with the European Union traceability measures), JBS took advantage of its Australian subsidiary to export to Europe until Brazilian beef exports to the EU resumed in 2009. Similarly, although no Brazilian meat producer could export cuts to the U.S. because of restrictive U.S. safety rules, JBS was able to enter the market through its own U.S. subsidiary. Also, the production of three different proteins, namely beef, pork and chicken, allowed JBS to hedge against changes in meat consumption preferences (Blankfeld, 2011).

#### **GROWTH FINANCING BY THE BRAZILIAN DEVELOPMENT BANK (BNDES)**

In 2004, the Brazilian government adopted the Policy of Productive Development, with the purpose of developing specific sectors of the Brazilian economy (MDICE, 2012). One of the chosen sectors was the meat sector, which was selected to become the world leader in exports. Brazil, with one of the largest untapped agricultural land reserves in the world, was ideally suited to fill this demand. With the support of the government and financing from the Brazilian Development Bank (BNDES), the meat sector see rapid

consolidation of some key players, and as a result of the successful policy Brazil became the world's biggest exporter of animal protein (specifically, the number one exporter in the world of beef and of poultry, and the fourth largest exported of pork). Meat is currently the second largest agribusiness export market in Brazil after soybeans (Marques, 2010).

The management of JBS took full advantage of the support from the Brazilian Government, and used the resources offered by BNDES to finance its key acquisitions. In 2005, the first international acquisition of JBS of Swift Armur in Argentina was financed by BNDES; the acquisition in 2007 of Swift in the U.S. was financed by a capital increase in which BNDES subscribed a portion of the new common shares; the acquisition in 2009 of Pilgrim's Pride was financed by an issue of convertible debentures that were primarily subscribed by the BNDES. As a result, BNDES controlled about 31% of the company's outstanding shares according to JBS's annual report.

The financing of JBS growth by the BNDES generated some discontent from other meat packers in Brazil, who considered it unfair competition, and among cattle breeders, who were concerned that the concentration into a small number of meat packers would lead to fixing of cattle prices. There were also critics of the interference of the state into businesses like JBS, which they termed state capitalism. In response to these criticisms, an investigation was undertaken by Federal Public Persecutors in Brazil into the relationship between JBS and BNDES. However, BNDES was found to be acting according to the government's development policy (Agência Estado, 2011).

#### THE DYNAMIC FORCES OF CHANGE

The meat packing industry is a mature industry in Brazil, and similar to much of the rest of the world, it handles the entire process, from the slaughtering of animals (mainly cattle, pork, sheep, and poultry) in specialized slaughterhouses, to the subsequent cutting, packaging, and distribution of the meat.

Traditionally, cattle slaughterhouses in Brazil were small local operations that bought animals from independent ranchers, slaughtered the animals, cut the meat, and sold the cut meat to the local butcher shops: this is how José Batista Sobrinho started in 1953 in the small town of Anápolis. Three dynamic forces have changed the Brazilian beef business.

The first force that changed the beef business was the squeezing out of small ranchers by larger rancher operations. These moved further to the interior of Brazil where land was inexpensive and where breeding of thousands of heads of cattle was possible. This created the need to transport cattle from the open ranges to the slaughterhouses and to fatten them to gain weight before being slaughtered. These large-scale cattle breeders and the intermediaries that were in the cattle fattening business started to impose their prices on the local slaughterhouses.

The second force was the expansion of supermarket chains, which needed quality packaged beef to sell to their clients. These supermarket chains squeezed the traditional local butchers out of business, and these local butchers had been the main clients of the local slaughterhouses. In addition, the volume that these supermarket chains purchased, and their quality requirements, imposed changes to the

traditional slaughterhouses: who had to aggregate meatpacking and implement a substantial number of sanitary and quality procedures. This increased the cost to the slaughterhouses, who were not compensated by the lower prices per unit that the supermarket chains were willing to pay based on their high volume requirements.

Squeezed between the large-scale ranchers and intermediaries on one side, and the supermarket chains on the other side, and with the higher cost of the operations, local slaughterhouses began to find themselves in financial difficulties. Taking advantage of the situation, JBS, along with some of the more effectively managed meatpackers, began to consolidate the industry by buying out those in trouble. The rationale for these horizontal acquisitions was a strategy to increase the capacity to slaughter cattle, in order to be able to build up a better bargaining position against the big ranchers and the cattle fattening intermediaries (on the supply side) and the supermarket chains (on the demand side). This is the reason that JBS (up until 2009) measured growth by the growth of its cattle slaughter capacity.

The third force that changed the beef business was the growing international demand for beef. The Brazilian government defined meat export as one of the priorities in their development policy. To access to the international beef market Brazil had to improve the entire beef supply chain. This requires investments by the Brazilian Development Bank in some key players (those that had the necessary scale and capacity to make the necessary changes to the supply chain to open the international markets for Brazilian beef): the most successful of these players was JBS.

#### THE ACQUISITION STRATEGY OF JBS

José Batista Sobrinho learned the business from the supply side in the 1950s by starting operation of purchase cattle to resell to slaughterhouses. In 1953, he learned to operate a small butcher shop and slaughterhouse, which he ran with his two brothers. The success of this venture motivated him to purchase an slaughterhouse in 1968 and another in 1970.

Sobrinho soon realized that he needed to increase his cattle slaughtering capacity to gain bargaining strength with the cattle breeders and the intermediaries who were fattening cattle to sell to slaughterhouses. He also realized that he needed to create a branded packaged beef to differentiate the beef he sold to supermarkets and to avoid commoditization. To achieve this he renamed the company Friboi, and encouraged customers to create demand for Friboi packaged beef in the supermarkets.

Sobrinho and his sons instinctively followed a resource-based competitive strategy in growing JBS (see Table 2). The key resource they used to build JBS was their slaughterhouses and the daily slaughter capacity of cattle which enabled them to gain bargaining power with suppliers. The capabilities they built up were the efficient operation of slaughterhouses, cost efficient processing and packaging beef, and the capability to market branded packaged beef to supermarkets (and so gain bargaining power with customers).

The acquisition strategy of JBS was a resource-based horizontal acquisition strategy up until the acquisition of Swift in the U.S. in 2007, the merger with Bertin in Brazil in 2009, and the acquisition of

Pilgrim's Pride (also in the U.S.) in 2009. The focus of the resource-based horizontal acquisition strategy was on acquiring beef slaughterhouses and packing plants to grow the cattle slaughter capacity.





Source: Adapted from Grant, 1991, p. 115

The acquisition of Swift in the U.S. in 2007 (with its slaughterhouses in the U.S. and Australia) was motivated by the possibility of increasing the cattle slaughter capacity and the need to establish operations in regions outside Latin America in order to deal more efficiently with currency fluctuations, sanitary restrictions, and other trade barriers. These issues were resource gaps (see Table II) that had to be filled for JBS to be a relevant actor in the world trade of beef. The acquisition, on the other hand, also included a concentric diversification into pork and lamb. This acquisition made JBS the third largest pork producer in the U.S. and with additional smaller acquisitions in Australia the world's leading lamb producer.

When JBS acquired Smithfield Beef in the U.S. in 2008, this consolidated its leadership as a beef producer. Together with the beef operations JBS, also acquired the largest cattle feeder in the U.S.: this was a major backward vertical diversification of JBS in the U.S.

The merger with Bertin in Brazil in 2009 was also motivated by growing JBS's cattle slaughter capacity; but it included a concentric diversification into leather. The merger consolidated the diversification that was started by JBS with the creation of JBS Couro (leather). With the merger, JBS

became a global leader in leather tanning; but the merger also included some conglomerate type of diversification into dairy products and canned vegetables, such that JBS is currently the third largest dairy producer in Brazil.

The acquisition of Pilgrim's Pride in the US in 2009 was another concentric diversification into poultry. With this acquisition JBS became the world's second largest poultry producer behind another U.S. firm, Tyson.

Like most large companies, JBS also made some smaller vertical and concentric diversifications, which potentially occupy management time that could be better employed by concentrating on the core business: JBS today manufactures cans, produces collagen, casings, beef jerky's, energy, biodiesel, oleo-chemicals, has a trading company, a shipping company, a cattle confinement operation, and an agricultural supply and service company JBS, 2012).

#### CONCLUSION

JBS was very successful in the beef packing business, especially with its resource-based horizontal acquisition strategy. In addition, the company has been very politically savvy in adapting itself to Brazilian government policies as witnessed by its continuing financial backing by the Brazilian Development Bank (BNDES) to acquire slaughterhouses and beef packing plants in Brazil, Argentina, Uruguay, and Paraguay. When JBS realized that its Latin America export platform was vulnerable to currency fluctuations, sanitary restrictions, and other trade barriers, it used the financial backing of the BNDES to acquire Swift in the U.S. during 2007, and operations in the U.S. and Australia, Smithfield Beef in the U.S., and Tasman Group in Australia in 2008. In 2009 followed the merger with Bertin in Brazil and the acquisition of Pilgrim's Pride with the strong financial backing of the BNDES. These acquisitions diversified JBS into pork, lamb, and poultry (among other less synergic businesses).

The simple resource-based horizontal acquisition strategy in the beef industry that promoted JBS success was fuzzed (lost focus) by the need to learn to operate with pork, lamb, and poultry in foreign countries without a home-grown experience (such as the experience JBS had in beef). Also, JBS diversified into many new businesses, and some were completely new (such as dairy products, which came with the acquisitions and the merger with Bertin). All this was complicated by the many locations all over the world, and starting in 2007 this led to an enormous task of consolidation for JBS management. It is no wonder that JBS had consolidation pains and that the firm's performance reflects this.

Probably the only way for JBS to return to its past performance (that is, the performance achieved prior to the international acquisitions) is to concentrate on its core business and shed all the unrelated businesses that are distracting the management team. It seems that JBS management is starting to do this, by spinning off its dairy product division. The concentration on JBS core business would also realign the firm with the objectives of the Brazilian Government's Policy of Productive Development.

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# FDI Halo vs. Pollution Haven Hypothesis

# Nadia Doytch<sup>\*</sup>

#### ABSTRACT

The paper examines the contradiction between the FDI Halo (Foreign Direct Investment Halo Hypothesis) and Pollution Haven Hypothesis and their implementation for explaining the effect of FDI on the environment. The article summarizes the existing empirical evidence and suggests further venues for future empirical research.

The environmental literature holds two conflicting hypotheses about the effect of FDI on the environment. FDI is hypothesized to have positive environmental spillovers very similar to its positive productivity spillovers. These positive externalities are largely due to the fact that FDI has the potential of transferring superior technologies from more developed to less developed economies. This hypothesis is oftentimes called the FDI "halo effect".

There is, however, a contrary view, based on the assumption that multinational companies (MNCs) can bring harm to the environment, if they are seeking to exploit the existence of lax host countries environmental regulation and pursuing a "pollution haven". This strategy is also known as the race-to-the bottom hypothesis. The empirical literature is yet to cast light over which hypothesis prevails.

A critical examination of the empirical literature reveals some evidence that supports both, the FDI halo and the Pollution Haven, hypotheses. Dissemination of environmentally clean technologies and environmentally friendly management practices is in part motivated by shareholder pressure in the MNC home countries and by environmental standards and practices established in the MNCs' home countries (Garcia-Johnson, 2000). After MNCs open up a branch or a subsidiary in the host country economy, the newly trained workers can further spread the environmentally sound technologies to the domestic firms (Görg and Strobl, 2004). Alternatively, the motivation for acquiring this knowledge can come from a direct competition of domestic firms with foreign MNCs.

A number of case studies find reduction of greenhouse emissions of multinationals compared to domestic firms. In a study on the mining sector of Chile, Lagos (1999) finds that few foreign-owned companies implemented responsible environmental policies at a time when Chilean regulatory framework was not yet developed. Similarly, in a study on the Argentinean firms, Albornoz et al (2009) find that foreign-owned firms are more likely to implement environmental management systems compared to domestic firms. At the same time, firms that supply sectors with high concentration of MNCs, who \*City regularly meet with them, are more likely to adopt environmental management systems. Furthermore, the

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firms' absorptive firms' absorptive capacity, ownership and export status also influence the extent to which they benefit from environmental spillovers.

On the other hand, there is plenty of evidence in support of the pollution haven hypothesis. When trade is liberalized, industries that pollute tend to shift from rich countries with tight environmental regulation to poor countries with weak environmental regulation. Conversely, clean industries tend to migrate towards rich countries. This is how Copeland and Taylor (1994) formulate the pollution haven hypothesis. The reasoning behind the hypothesis is that environmental regulation increases costs, which in turn makes exports of countries with strict regulation more expensive, relative to exports from countries with lax regulation (Grossman and Krueger, 1993; and Tobey, 1990).

Additionally, with opening to trade, the pattern of trade itself may be shifting towards pollutionintensive goods (Low and Yeats, 1992). A consideration is that since MNCs factor regulatory costs into their location decisions, high costs may deter MNCs from investing (List et al., 2004; Becker and Henderson, 2000).

Proponents of the pollution also state that there is not enough evidence of positive technological spillovers of FDI on the first place. There are studies that show that foreign firms do not display better environmental performance than the domestic firms (Hettige et al, 1996; Desgupta et al. 1997) and that they tend to underperform (Aden, et al., 1999).

A recently proposed new approach by Doytch and Uctum (2011) is to explore which hypothesis- FDI halo or pollution haven prevails based on a sector-level performance of FDI. When FDI is disaggregated into sectors (agriculture, mining, and manufacturing, total services, financial and nonfinancial services), and an Environmental Kuznets Curve is fit into the empirical model, the authors find that FDI flows into manufacturing support the pollution haven argument, while those flowing into services support the halo effect hypothesis.

In summary, the evidence of FDI halo vs. the pollution havens, at least in country-level studies, is very mixed. Sector-level approach may be needed to answer the question of which hypothesis holds: the FDI halo or the pollution haven. The mechanisms of capturing of the environmental spillovers are also not very well understood. There is a need for policies that prescribe how to better capture these spillovers and a need for policy recommendations of how to create incentives for generating more environmentally friendlier knowledge from FDI, such as environmentally friendly R&D activities and science and technology education.

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# What do Investment Practitioners Read?

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#### ABSTRACT

Articles abstracted in the CFA Digest over the 1997-2011 period are used to proxy what investment practitioners read. We find that about 20% of the abstracted articles are from the "top three" academic financial journals and about 50% are from the "top 21" academic financial journals. Equity Investments, Portfolio Management, Economics, and Alternative Investments have consistently been the major topics of interest to the investment practitioner. These results indicate that investment practitioners use a wider source for information than the top academic financial journals.

#### INTRODUCTION

For many years, the usefulness of financial research has been questioned. So far, it is academics who have asked such questions as: which are the "top journals" in finance? Or: do the top journals publish only "top articles"? Or: Do lesser journals publish "top articles"? The current research expands the usual questions to ask whether the investment practitioner benefits from academic financial research.

The CFA Institute is a self-regulating professional organization with over 100,000 members worldwide. Benefits of membership include the opportunity to earn Chartered Financial Analyst (CFA) and Certificate in Investment Performance Measurement (CIPM) designations, advocacy concerning market efficiency and investor protection, and the dissemination of information via seminars, webcasts, conferences and publications, including the Financial Analysts Journal, conference proceedings, CFA Magazine, a daily newsletter, and the CFA Digest.

As the investment area of finance has grown, the volume of published work has exploded making it difficult to stay current in the field. To help alleviate this problem to some degree, the CFA Digest was established in the summer of 1971 as a quarterly publication to provide summaries of some of the articles published in journals and magazines. Readership surveys indicate that "the CFA Digest meets [readers'] expectations", and that it is "highly relevant to [the readers'] needs and is of high quality" (Sullivan, 2009, p. 1). The survey results support the use of the articles abstracted in the CFA Digest as a proxy for what the investment practitioner considers to be important professional readings.

Articles abstracted in the CFA Digest from 1997 to 2011 are included in the study. Our objective is to find what percentage of articles come from "top academic financial journals", and whether this has changed over time.

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The CFA Digest classifies articles into categories which indicate the topic of the article abstracted. Since 2002, the categories correspond to the core knowledge categories in the CFA Institute's Continuing Education Topics for Investment Professionals. We also sort abstracts into these categories to find which areas of investments are of more interest to the investment practitioner, and if there has been a change in the areas of interest over time. Since the CFA Institute changes the categories over time, we used the categories as of January 2011 for our classification scheme.

Over the 1997-2011 period, 2,074 articles were abstracted in the main section of the CFA Digest. About 20% of the abstracted articles are from the top three academic financial journals, and about half are from the top 21 academic financial journals. The major areas of interest to the investment practitioner are Equity Investments, Portfolio Management, Alternative Investments, and Economics. Top academic financial journals are a major source for the first two categories but not for the latter two categories.

The remainder of this paper is organized as follows: The next section provides a review of the ranking of financial journals literature. The literature review is followed by a brief description of how an article is selected for inclusion in the CFA Digest, how this study determined which journals are "top academic financial journals", and how the classification categories are determined. The results section is followed by a conclusion section.

#### LITERATURE

Citations in journals are often used to define a "top journal". Borokhovich, Bricker, and Simkins (1994) used interjournal citations from eight finance journals in 1990 and 1991 and found that the Journal of Finance (JF) and Journal of Financial Economics (JFE) had the highest number of citations in other journals. Alexander and Mabry (1994) used citations from the JF, JFE, Journal of Financial and Quantitative Analysis (JFQA), and Review of Financial Studies (RFS) over the January 1987 to March 1991 period to rank the top 50 finance journals, and they ranked JFE, JF and JFQA as the top three journals. Arnold, Butler, Crack and Altintig (2003) ranked journals based on citations in the same four journals plus the Journal of Business (JB) and Financial Management (FM) during 1990-1999. The authors found that the ranking of journals differed depending on the criteria used, but JF, JFE, RFE, JFQA and JB are consistently the top five journals. The authors also concluded that the JF, JFE and RFS are the top three academic financial journals.

In additions to citations, other methods have been used to determine "top journals". Borde, Cheney and Madura (1999) survey department chairs and found the JF, JFQA, JFE, JB, and RFS to be considered the "top journals". Christoffersen, Englander, Arize, and Malindretos (2001) surveyed members of the Financial Management Association (FMA) and found the top journals in corporate finance are JF, JFE, JFQA, and FM, but the top journals in investments are Journal of Portfolio Management (JPM), JF, and the Financial Analysts Journal (FAJ). Oltheten, Theoharakis, and Tavlos (2005) surveyed finance faculty and found that the JF, JFE, RFS, and JFQA are perceived to be the "top journals".

Borokhovich, Bricker, Brunarski and Simkins (1995) used 16 finance journals to examine institutions' research productivity over the 1989-1993 period. Chan, Chen, and Steiner (2002) ranked institutions on a global scale based on productivity in a similar set of 16 journals over the 1990-2001 period. The Chan et al. study substituted the Journal of Financial Intermediation for the Journal of Money, Credit and Banking (JMCB) which was used by Borokhovich et al. The JMCB was considered to contain mostly economics articles as opposed to finance-oriented articles. In the Chan et al. study, the JF, JFE and RFS are considered to be the "top journals". Chan and Fok (2003) used the same group of 16 journals as Chen et al. (2002) to rank finance departments based on memberships on journal editorial boards. Smith (2004) used a subset of 14 journals from Chan et al. (2002) plus the JMCB to examine whether top articles are published in top journals.

Chan, Chen, and Lung (2007) expanded the list of 16 journals from Chen et al. (2002) to 21 journals to study global research productivity over the 1990-2004 period. This group of 21 journals is also used by Hardin, Liano, Chan and Fok (2008) to examine what factors influence the selection to the editorial board of a finance journal. The current study uses this group of 21 journals to examine whether investment practitioners read top academic financial journals.

#### METHODOLOGY

#### SELECTION OF ARTICLE FOR CFA DIGEST<sup>1</sup>

An article must pass a rigorous screening process to be included in the CFA Digest. Its editors make the first selections from recommendations made by others and from their own readings. The article is then sent to an investment professional, who may be an academician or a practitioner, to write an abstract. The abstract is usually about 600-650 words long excluding a 100-word abstract of the abstract. Next, the abstract and the original article are sent to one or more members of the Editorial Board for a third screening. The Editorial Board member evaluates both the article and the abstract for its quality and its appropriateness to the CFA Digest. In other words, a poor abstract of a good article may be rejected as may a good abstract of a poor article. The editors make the final decision about the inclusion of an abstract in the CFA Digest.

### JOURNALS

Since 1977, at least one article from each of over 100 journals or magazines has been abstracted in the CFA Digest. Our interest consists of the portion of the abstracted articles from the "top journals", using two classifications of "top journal". The first classification is the "top three journals" consisting of the Journal of Finance (JF), the Journal of Financial Economics (JFE), and the Review of Financial Studies (RFS). The second classification expands the "top journals" designation to the "top 21 journals" used by Chan, Chen, and Lung (2007). In addition to the top three journals, this list includes: Financial Analysts Journal (FAJ), Financial Management (FM), Financial Review (FR), Journal of Banking & Finance (JBF), Journal of Banking, Finance & Accounting (JBFA), Journal of Business (JB), Journal of Corporate

Finance (JCF), Journal of Empirical Finance (JEF), Journal of Financial and Quantitative Analysis (JFQA), Journal of Financial Intermediation (JFInter), Journal of Financial Markets (JMkt), Journal of Financial Research (JFR), Journal of Financial Services Research (JFSR), Journal of Futures Markets (JFM), Journal of International Money and Finance (JIMF), Journal of Portfolio Management (JPM), Pacific-Basin Finance Journal (PBFJ), and Review of Financial of Quantitative Finance and Accounting (RQFA). Of these 21 journals, four journals (JBFA, JEF, JMkt and JFSR) have not had an article abstracted for the CFA Digest, probably due to their orientation to areas of finance and economics other than practitioneroriented investments.

Over the years, the CFA Digest has consisted of several sections including the main part, "Research Foundation of CFA Institute Monograph", "Select Financial Analysts Journal Author Summaries", and "Items of Interest". In the main part, the articles are sorted by categories. Only articles included in the main section are included in our study so we may use the same categories as the editors of the CFA Digest. Note, over the 2002-2008 period, authors of some FAJ articles wrote abstracts of their articles for the CFA Digest. The FAJ is published by the CFA Institute and is in the "top 21 journals" group. Since these articles were not allocated to a category by the editors, they are not included in the study. This means the proportion of abstracted articles from the "top 21 journals" is underestimated during this period.

#### CATEGORIES

The article abstracts in the main section of the CFA Digest are classified by the editors of the CFA Digest into categories that indicate the broad topic of the abstracted articles. We propose that categories of greater interest to the investment practitioner will include more article abstracts. A change over time in the portion of article abstracts in the various categories indicates a change in the topic areas of interest to the investment practitioner.

A complication in this investigation is that the category labels have changed over the years. Since 1997, over 40 categories have been used to classify abstracted articles. There are many reasons for the changes in category labels, including name changes (i.e., Fixed Income versus Debt Investments), a clarification of a category (i.e., Risk Measurement and Management versus Risk Management), the divesture of one category from another (i.e., Derivatives from Risk Management and Derivatives) or the addition of a new area (i.e., Behavioral Finance). Beginning in May 2002, the editors began using the same categories as used in the CFA Institute's Continuing Education Topics for Investment Professionals (TIP). We decided to use the 21 TIP categories as of January 2011 to indicate the topic area of each article abstracted in the CFA Digest, and as much as possible, we tried to fit the other categories into these 21 categories. The one exception is Behavioral Finance, which became a category in 2010, and we decided to include this as a separate category. Consequently, changes in abstract categories are examined for the 2002-2011 period so we can use the category allocation made by the editors of the CFA Digest as much as possible. The final list of 22 categories includes: Alternative Investments (AI),

Advocacy, Regulatory and Legislative Issues (ARL), Behavioral Finance (BF), Business Strategy (BS), Corporate Finance (CF), Corporate Governance (CG), Debt Investments (DI), Derivative Instruments (Derl), Economics (E), Equity Investments (EI), Ethics and Professional Standards (EPS),Firm Management (FM), Financial Markets (FMkt), Financial Statement Analysis (FSA), Investment Industry (II), Investment Theory (IT), Managing the Investment Process (MIP), Portfolio Management (PM), Private Wealth Management (PWM), Quantitative Tools (QT), and Risk Measurement and Management (RMM).

## RESULTS

Table 1: Percentage of CFA Digest Abstracts from "Top" Journals						
Year	Number of Abstracts	Abstracts from Top 3 Journals	Percentage of Abstracts from Top 3 Journals	Abstracts from Top 21 Journals	Percentage of Abstracts from Top 21 Journals	
1997	106	17	16.0%	63	59.4%	
1998	122	26	21.3%	64	52.5%	
1999	146	25	17.1%	70	47.9%	
2000	150	25	16.7%	83	55.3%	
2001	151	25	16.6%	82	54.3%	
2002	137	37	27.0%	68	49.6%	
2003	139	29	20.9%	69	49.6%	
2004	137	11	8.0%	58	42.3%	
2005	115	21	18.3%	57	49.6%	
2006	120	23	19.2%	64	53.3%	
2007	128	36	28.1%	75	58.6%	
2008	124	29	23.4%	67	54.0%	
2009	169	35	20.7%	74	43.8%	
2010	160	28	17.5%	72	45.0%	
2011	170	32	18.8%	78	45.9%	
Total	2,074	399	19.3%	1,044	50.8%	

## Table 2: Percentage of Abstracts Allocated to Top Four Categories

Category	All Abstracts	Abstracts from Top 3 Journals	Abstracts from Top 21 Journals
AI	10.6%	6.4%	7.2%
E	10.8%	4.4%	4.3%
EI	15.4%	23.1%	20.2%
PM	13.9%	15.0%	18.2%

Table 1 presents the number of article abstracts included in the main section of the CFA Digest over the 1997-2011 period, the number and percentage of abstracted articles from the "top three journals", and the number and percentage of abstracted articles from the "top 21 journals". A total of 2,074 abstracts were published ranging from 106 abstracts in 1997 to 170 abstracts in 2011. Overall, 19.3% of the article abstracts are from the top three journals with a range of 8.0% in 2004 to 28.1% in 2007. The low

contribution of the top three journals to the CFA Digest in 2004 appears to be an outlier, and the average number of abstracts from the top three journals increases to 20.1% if this year is omitted. Finally, 50.8% of the article abstracts are from the top 21 journals with a range of 42.3% in 2004 to 59.4% in 1997. The results indicate that about 80% of the article abstracts are not from the top three academic financial journals and about half are from sources other than the top-21 academic financial journals. This implies that investment practitioners do read the top academic financial journals, but they also read other finance-oriented material.

Table 2 provides the percentage of abstracts allocated to the top four categories for all abstracts. The percentage of abstracts from the top three journals and the top 21 journals for these categories is also provided2. The four categories with the highest allocation account for 50.7% of the abstracts and include: Equity Investments (15.4%), Portfolio Management (13.9%), Economics (10.8%), and Alternative Investments (10.6%). It is not surprising that these are the most popular topics since the CFA Digest represents the interests of the investment practitioner. It is interesting that 17 of the 22 categories (77.3%) have at least 1% of the abstracts allocated to them. This indicates that there is a wide variety of topics with which the investment practitioner tries to stay abreast.

Of the article abstracts from the top three finance journals, the top two categories correspond to the top two categories from all abstracts. The Equity Investments (23.1%) and Portfolio Management (15.0%) categories account for 38.1% of the articles from the top three journals that are abstracted in the CFA Digest. Similar results are also found for the top 21 journals where Equity Investments (20.2%) and Portfolio Management (18.2%) account for 38.4% of article abstracts. These results indicate that the major academic financial journals are a source of information for the two major practitioner areas of investments.

The other two areas that have broad interest to the investment practitioner did not come from the top academic financial journals. Corporate Governance, Investment Theory and Debt Instruments have larger abstract allocations from the top three journals and/or the top 21 journals than Alternative Investments and Economics. Alternative Investments accounts for only 6.4% of articles abstracted from the top three journals and 7.2% of articles abstracted from the top 21 journals; and, Economics accounts for 4.4% of articles from the top three journals and 4.3% of articles abstracted from the top 21 journals. The Alternative Investments topic is a specialized area, and articles concerning this topic are less likely to appear in major general academic financial journals. In November 2009, 19 of the 59 articles (32.2%) were allocated to the Economics category which increased the weight allocated to this category. As with Alternative Investments articles, Economics articles are less likely to come from academic financial journals and are more likely to appear in academic economic journals such as the American Economic Review and the Economists.

The percentage of abstracts allocated to each category annually is examined. The number of categories having 1% or more articles allocated to it ranges from 11 in 2008 to 17 in 2010 with an

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average of 14.5 categories and a median of 15 categories per year. The results indicate that the investment practitioner has a wide range of interests.

The results also indicate that some topics are of greater interest to the investment practitioner than other topics. Table 3 shows the annual percentage of abstracts allocated to the top four categories over the 2002-2011 period3. More than half the article abstracts are allocated to the top four categories in each year except 2003, when 46.1% of the article abstracts were allocated to the top four categories. The most popular categories are Equity Investments, which is in the top four categories with the most allocations in all 10 years; Portfolio Management, which is in the top categories in eight of the 10 years; Alternative Investments, which is in the top four categories has been a top-four category for each of the last three years. These results indicate that the topics of interest to the investment practitioner have remained consistent over the period of this study.

Some other topics generated less interest. An article was allocated to the Business Strategy (BS) category only in 2006 and to the Managing the Investment Process (MIP) only in 2007. Firm Management (FM) and Quantitative Tools (QT) have had articles abstracts assigned to their category in only five of the 10 years. Since article abstracts often can be categorized into one of several categories, low-percentage categories may be due in part to the allocation of articles to alternative categories. For example, Private Wealth Management (PWM) is similar to the MIP category. Additionally, some topics are of less interest to the finance investment practitioner, who is more interested in the application of investment concepts to making money. Topics such as Business Strategy, Firm Management and Quantitative Tools may be of more interest to the general business practitioner or the finance academician than to the investment practitioner.

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Category	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
J										
Δ1		7 2%	16 1%	1/ 8%	10.8%		1/ 5%		12 5%	
		1.270	10.170	14.070	10.070		14.370		12.570	
CF	15.3%	9.4%								
CG			10.9%	10.4%	10.0%					
DI			10.2%	14.8%	16.7%	9.4%				9.4%
F	9.5%					9.4%		19.5%	20.0%	14 1%
-	0.070	44 50/	40.00/	00.00/	00.00/	40.00/	00.00/	44.00/	40.40/	47 70/
EI	9.5%	11.5%	10.2%	22.6%	20.0%	18.8%	22.6%	11.2%	13.1%	17.7%
IT						11.7%	10.5%			
PM	16.1%	18.0%	16.1%			13.3%	11.3%	14.2%	18.1%	13.5%
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Table 3: Annual Percentage Allocations to the Top Four Categories

# CONCLUSION

The CFA Digest over the 1997-2011 period is used as a proxy for the readings of the investment practitioner. During this period, 2,074 articles from over 100 journals were abstracted in the main section of this quarterly publication. The results indicate that major academic financial journals are an important source of information for the investment practitioner, with about 20% of the abstracted articles coming from the top three academic financial journals and about 50% from the top 21 academic financial journals.

These results also support the opposite corollary that the investment practitioner reads more than just the top academic financial journals with about 50% of the abstracted articles from non-top academic financial journals. The importance of non-top academic financial journal may increase in future years since the editors have indicated an increase in the sources used for articles that are abstracted in the CFA Digest (Sullivan, 2009).

The investment practitioner reads across many topics in the investment area with Equity Investments, Portfolio Management, Alternative Investments, and Economics the most popular topics. The top academic financial journals are a major source of information concerning Equity Investments and Portfolio Management, but these sources are less important for Alternative Investments and Economics articles. These results are consistent with Smith (2004) who found that a "top article" in terms of the Social Sciences Citation Index had a 44% probability of not appearing in a top journal. We also conclude that good articles from the investment practitioner's point of view do not always come from the major academic financial journals.

The sources of useful information for the investment practitioner have exploded in recent years. It is becoming increasing difficult to find the information and to determine what is important and what is noise. This increases the importance of publications such as the CFA Digest to the investment practitioner.

#### **ENDNOTES**

Both authors of this paper are under contract to write abstracts for the *CFA Digest*. M.E. Ellis also serves on the Editorial Board

The percentage of abstracts allocated to each of the categories is available from the authors.

The annual percentage allocation of abstracts to all categories is available from the authors.

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# Social Entrepreneurship and Issues of Scale

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#### ABSTRACT

Social entrepreneurs have demonstrated the potential to address a host of social, economic and environmental problems that plague our planet. However, there is an urgent need to scale up these efforts. Typically, scaling up is achieved through standardization. However, SE often calls for high contact, and standardization might defeat its very purpose by limiting responsiveness to those unique situations where the commitment and values of field staff that are important. The tensions between economies of scale and efficiency and the need to customize responses to unique situations are explored in the context scaling up.

#### INTRODUCTION

Social Entrepreneurship (SE) has in the last few years emerged as a growing field of both, academic research and even more significantly as a field of action in a world that clearly is plagued by a plethora of issues that call for urgent action. Poverty and climate change are the burning global issues of our time. Estimates suggest that about four billion of the world's population live below or close to the poverty line—they survive on US\$ 2 or less per day (Prahalad, 2005). It is unlikely that even a day goes by when we do not hear about the problems of climate change and global warming. There is broad consensus as indicated by the UN sponsored Intergovernmental Panel on Climate Change, Pachauri & Reisinger(2007) that the earth is warming at an alarming rate and that there is a high level of certainty that climate change is a product of human behavior. In addition, we have problems of violence, disease, limited or no access to energy, clean water, shelter, clothing, nutrition and other basic needs. Various parts of the world, particularly in Asia and Africa are particularly vulnerable.

While there are some variations in the definitions of SE, one universal theme is that the term refers to those initiatives that have explicit social objectives and a process or model in place to deliver on those objectives. According to Dees (2001), the generation of income is not the primary purpose of entrepreneurship. Rather, entrepreneurship is the recognition of opportunity or a need and seeking innovative ways to fulfill that need. Dees points out that Drucker made it a point to not just include, but also hold up as an example the institutions of higher education as examples of entrepreneurship. The term, Social Entrepreneurship was coined by Bill Drayton, the founder of Ashoka,Bornstein(2004);

Bornstein & Davis(2010) to focus on the activities of those people who launched programs and organizations to implement a change to benefit society. We follow this definition in this paper. Any

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entrepreneurial activity that focuses primarily on bringing about a sustainable change for the better in society would be included in our definition of SE. We believe this definition is broad enough to include a variety of commendable efforts to bring lasting and positive change in relation to society and environment. Our definition does not consider financial or economic outcomes unimportant. However, we see the primary purpose of positive financial outcomes as a means to an end—an end that focuses on achieving positive changes that benefits society at large. We should note here that this definition is not without controversy as noted by the CASE Report (2008), Martin and Osberg (2007) and Makhlouf (2011). Some of these authors note that the field is even divided on the need for a clear definition (CASE Report, 2008). We acknowledge that many commercial organizations also are instrumental in generating social change. We distinguish them by arguing that social change is not their primary purpose.

One of the key issues in the context of Social Entrepreneurship is achieving levels of scale that will significantly impact society and the earth. As noted earlier, faced with a situation where close to two-thirds of the world's population lives in or near poverty of which a billion people suffer from chronic poverty and have little hope (Collier, 2008). About 2 billion people do not have access to energy (other than firewood) and a billion people do not have access to safe drinking water. When we add in the impact of climate change, deforestation and other environmental issues, the future for people living under these conditions gets even bleaker. Well intentioned social entrepreneurs, social workers, governments and others have made serious attempts to enable greater participation of affected people in world economic activity and address the problem of poverty and the accompanying problems of access and inclusion. The problem however is extremely large. In addition, it is a problem that needs to be addressed quickly—we cannot wait to address serious problems of hunger and malnutrition—many will die and the problems will only escalate. Alvord, Brown & Letts (2004) argued that SE is about social transformation, implying large scale. In that context, SE's need to take their efforts and expand sufficiently to break the social equilibrium, Light(2009) that keeps us trapped in a system that generates and sustains the problems described above.

There is general agreement that while SE has provided proof of concept in a variety of arenas scaling-up presents some unique challenges. For instance, while SE's are often able to mobilize financial resources on a small scale, it becomes much harder to attract investments to scale up unless they are able to offer returns on investment that are at close to the returns that may be possible in a business enterprise. Even more problematic are the organizational issues. Some of the activities that SE's undertake require high levels of interaction with the people they serve. The quality of this interaction is a key factor in determining their success on the effort. For instance, in the area of microfinance, the level of contact by local officers and the local support groups are critical in maintaining the loan recovery rate. Scaling up by traditional means has the potential to dilute this contact, diluting a critical aspect of a social entrepreneurial effort. On the other hand some types of social entrepreneurship require large investments which necessitate the achievement of economies of scale so that the services being provided can be made available to the poor at an affordable price. Healthcare in general and surgical services in particular clearly demonstrate the need for economies of scale. However, in this case the delivery of quality services also call for close contact with patients and SE's have to find a way to achieve economies of scale even while they provide high quality personalized services.

#### LITERATURE REVIEW

The field of social entrepreneurship is so new there is very limited research that addresses the issue of scale. Most of these explorations of scale are based on case studies that have focused on the growth of individual social enterprises and their unique contexts. For instance, Alvord, Brown & Letts (2004) discuss seven cases of successful social enterprises from a variety of locations and dealing with a variety of social issues. Based on these cases, they developed a series of propositions on the growth and effectiveness of social entrepreneurship. Firstly, they discuss three patterns or strategies for scaling up—expansion of services to more people, expansion of the types of service offerings and changing the behavior of other actors within a service area to reinforce their work towards social transformation. They argued that the strategies for scaling up differed with the type of innovation the SE was engaged in. When the innovation focused on capacity building, scaling up involved a simple expansion of the capacity building services (training, etc.) to as many people as possible. In the case of package delivery (e.g. microcredit), scaling up would likely involve the offering of additional services to support the package (e.g. marketing support to micro businesses). Finally, if the SE effort involved movement-building, then scaling up would require expanding the scope to gain support of other stakeholder groups concerned with the movement building effort.

Taking a more normative approach, Dees, Anderson & Wei-Skillern (2004) examine the pros and cons of different ways of scaling impact (in contrast to the enterprise itself). They discuss dissemination, affiliation and branching as approaches to scaling impact. Dissemination involves spreading knowledge and information about an innovation focused on achieving social impact. This is the least demanding—the innovator/entrepreneur simply provides knowledge and experience to anyone who is interested. The affiliation approach, involves a range of possibilities from loose agreements to more formal franchising operations. Finally, the branching approach calls for the greatest commitment with the SE setting up operations at multiple locations. Dees et al., (2004) recommend that SE's focus on five questions to make a choice on the best approach to scaling up. They refer to them as the 5R's and they are presented in Table 1.

As can be seen from the literature above, researchers have paid some attention to the issue of scaling up in the context of social entrepreneurship. There is strong agreement that if social transformation, Alvord, Brown & Letts(2004) has to be achieved, then the current social equilibrium needs to be broken and that can only be achieved if the efforts of SE's reach a certain minimum scale.

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### Table 1: The 5R's for SE scaling

Readiness: Is the innovation ready for spread? Receptivity: Will target populations be receptive to the innovation? Resources: What resources, financial and otherwise, will be needed? Risk: What are the chances that the innovation will be implemented incorrectly or have limited impact? Returns: What kind of impact will it have, both qualitatively and quantitatively?

However, SE's focus on a wide variety of social issues and the meaning of scale and the process through which scale may be achieved will vary. The 5R's proposed by Dees et. al. (2004) are useful here. In the following paragraphs we will build on this work and focus on the organizational challenges that scaling up presents. We use Mintzberg's (1979) framework to understand the pulls and pressures that organizations face in their lifecycles as they transition from their entrepreneurial roots to maturity.

Typically, an organization operates as an adhocracy in the early entrepreneurial stages of its lifecycle. As an adhocracy, there is little formal organization or structure and the participants in such a structure take on whatever work needs to be done. The organization is driven by commitment. Participants are driven to succeed and will contribute long hours to ensure success. We believe most SE's tend to have at least some characteristics of the adhocracy. These entrepreneurs are driven by and committed to the need to impact society in a positive way. They identify deeply with their causes and will likely do whatever it takes to fulfill their missions. The organization at this time is characterized by flexibility and responsiveness to unexpected situations. Such organizations are relatively small. Entrepreneurs at this stage would be concerned that scaling up would result in a loss of focus on the mission of the organization. These organizations are well suited to those types of activities that require close contact and customized responses to unique situations. In this case entrepreneurs may choose to scale up vicariously. Since their activities are commitment based, they would scale up when they meet others who have a similar commitment and share their values. Scaling up would be most appropriate in new geographical areas. They may also scale up methods and processes. For instance, effective adult education methods in agriculture may be applied to nutritional and health education.

With growth, organizations are called upon to make more efficient use of their resources. At one level they apply the learning acquired at the entrepreneurial stage to standardize their activities. Mintzberg (1979) refers to this as a pull toward the machine bureaucracy or the professional bureaucracy. Note however, that standardization implies a lower level of responsiveness to unique needs and expectations. Here it becomes a balancing act for the social entrepreneur. An efficient use of resources implies that more people can be served. On the other hand it does present the possibility that individualized services may be diluted. This dilemma is particularly relevant in healthcare where the fixed costs are very high and the only way to make quality services available to the poor is to scale up and benefit from economies of scale. For example, two hospitals in India, Aravind Eye Hospital and Narayana Hridaylaya both provide high quality surgical services. They have developed efficiencies with a high degree of standardization. However, they maintain personalized and individual contact pre and post surgery where human contact is more important. Thus they balance the pull towards machine and professional bureaucracy by doing a

deeper analysis of the work and how they go about it. More recent developments make extensive use of technology to link scarce resources (qualified specialists) with patients. In these cases, less qualified and lower paid field staff perform early examinations and diagnostics. Only those cases requiring specialist services are linked to qualified doctors via the internet. The specialists and field staff coordinate to provide the care needed.

Mintzberg (1979) discussed the pull to balkanize as organizations attempt to leverage their skills and resources in fields other than their original area of business. We see this as an opportunity to scale up the area of social entrepreneurship itself as there are numerous areas where the knowledge and resources generated in one field of activity may be leveraged in other fields of activity. Our observation is that SE has a highly networked community and the potential to engage in diversification, leverage synergies and serve more people and/or provide more services is huge. Organizations like Ashoka, the Skoll foundation, the Schwab foundation and others enable these entrepreneurs to exchange ideas and support each other.

Finally Mintzberg (1979) argues that as organizations become bureaucratized, they begin to understand the limitations that standardization imposes on them. As a result there are moves to bring more of the entrepreneurial and adhocratic characteristics back to the organization. While Mintzberg's pentagon surely provides us with a framework to develop strategies for scaling up in the context of SE, we believe strongly that we must not lose sight of a critical characteristic that is so important to meeting the social objectives that these entrepreneurs set for themselves-their values. The drive to start and persist with an enterprise with a social mission is usually not an easy task. These entrepreneurs almost always face a major uphill task in mobilizing financial resources. Unlike business entrepreneurship, they can rarely promise investors a high financial return on investment. These activities are often risky and challenge the status quo. Their work is usually among the poor and/or in rural areas. Their working conditions are therefore often limited by traditional business standards. In some cases, like microfinance, they upset traditional moneylenders and therefore may be subject to violence. In fact, poverty alleviation activities will have an impact on local politics, which in turn has implications for the social entrepreneurs. In this context values and commitment are critical ingredients of the field which will be hard to maintain as they scale up and standardize. So the real challenge for these entrepreneurs is to find the appropriate balance.

### CONCLUSION

In conclusion, scaling up in the context of SE needs to consciously emphasize the values and intentions that gave rise to the enterprise in the first place. Focusing on social and environmental issues calls for a special type of commitment that is accompanied with a willingness and a passion to overcome all kinds of difficulties. SE's may at times need to sacrifice growth to maintain their focus on their mission. This is likely to be a constant source of tension. In addition, financial returns may be limited forcing the leadership of these organizations to spend time mobilizing funds to sustain themselves financially. These

are emerging issues in the field of SE and we believe that the commitment and passion of practitioners along with their innovativeness will enable them to find ways to address the very large and significant problems that they have had the courage to tackle.

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# Performance of Insured Bonds after the Insurers' Downgrades: Some Preliminary Results

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#### ABSTRACT

Financial guaranty insurance played an important role in the municipal bond market during the years up to the financial crisis, covering over 50% of new issuance at its peak in 2005. During the financial crisis, the seven AAA/Aaa financial guaranty insurers which dominated this industry all lost their AAA/Aaa status. We study the effect these downgrades had on yields in the municipal bond market, both on insured debt and uninsured debt, by analyzing market prices around the dates of significant events. We also examine changing patterns in issuance in the municipal bond market which may be attributable to the lack of AAA insurance.

Preliminary findings are that yields were volatile on both insured and uninsured municipal bonds during the height of the crisis, driven more by wholesale reaction to market events than nuanced responses to specific news about certain insurers or municipalities. Since the insurers' financial strength fell as the markets weakened, the insurance did not protect insured bond investors from market turmoil. Since the crisis, data compiled suggests insured bonds have been trading at discounts to uninsured bonds.

#### INTRODUCTION

Financial guaranty insurance played an important role in the municipal bond market during the years up to the financial crisis, covering over 50% of new issuance at its peak in 2005. The par value of municipal bonds insured declined from \$201 billion in 2007 to just over \$15 billion in 2011 (Marte, 2012).

Prior research (Lau, 2012), has shown that on average bond insurance reduced issuance cost for municipalities. During the financial crisis, the seven AAA/Aaa financial guaranty insurers which dominated this industry all lost their AAA/Aaa status. We study the effect these downgrades had on yields in the municipal bond market, both on insured debt and uninsured debt, by analyzing market prices around the dates of significant events and over time. We also examine changing patterns in issuance in the municipal bond market which may be attributable to the lack of AAA insurance.

Preliminary findings are that market volatility after certain events of 2007 and 2008 affected both insured and uninsured bonds similarly. Yield movements during the crisis seem to be driven more by wholesale reaction to negative news than nuanced responses to specific news about certain insurers or municipalities. Since the insurers' financial strength fell as the markets weakened, the insurance did not protect insured bond investors from market turmoil.

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Insured bonds traded wider than uninsured AAA/Aaa bonds even before the financial crisis and widened even further during and after the crisis. AA municipal bonds historically demanded a premium over insured bonds. However, this situation reversed during the financial crisis; on average yields on insured bonds are now higher than on uninsured bonds. This paper details that inversion and explores explanations for insurance being given a negative value by the market.

This research is of importance both for investors and municipalities. Municipal bonds have traditionally been viewed as safe investments, with insurance enhancing their liquidity. The downgrade/bankruptcy of the insurers means that this is no longer true and investors need to adjust their portfolios accordingly. Municipalities can no longer raise debt as easily and cheaply as before the crisis and therefore have to adjust their financial plans. Less complex instruments may be called for; size of issuance may need to be adjusted downward for the larger issuers and upwards for the smaller to enhance liquidity. This paper will proceed as follows: after a brief review of other literature, we discuss effects on general obligation bonds, hospital bonds, reasons for the trade movements, then conclude.

#### LITERATURE REVIEW

Published research on this topic appears non-existent, but we did find two relevant working papers which examine the relationship between insurance and municipal bond yields. Gao Liu's (2011) work is possibly the most insightful vis-à-vis our work, while Bergstresser et al. (Bergstresser, Cohen, & Shenai, 2010), similar to our paper, examine the effect of the financial crisis on insured bonds.

Liu (2011) finds a positive relationship between the bond insurance premium charged and the probability of a downward rating migration on the underlying bond. He concludes that the insurance therefore benefitted the market by providing information. If Liu's results are correct then the insurers may have been insuring lower quality bonds within the same rating category.

Bergstresser et al. look at trades of municipal bonds with underlying A ratings and find that A-rated bonds with insurance traded at yields close to 3 basis points lower on average than similar bonds without insurance from 2000 to 2007. In 2008 and 2009, yields on the insured bonds were 14 basis points higher. (Bergstresser, Cohen, & Shenai, 2010). They attribute this phenomenon mainly to illiquidity of these bonds.

Our work looks for jumps in yields at different significant dates to gain insight into market reaction to financial news. We use a large set of bonds in an attempt to smooth any results from a specific municipality that might have had negative financial results of its own around the same dates. We look at the data and attempt to fit a story to it, rather than the more traditional research style of establishing a hypothesis and then finding the appropriate data to test it.

#### **RESULTS OF ADVERSE ACTIONS ON G.O. BOND YIELDS**

We first looked at the response of general obligation bonds to negative events in the market, using information downloaded from Bloomberg. General obligation bonds are the plain vanilla bonds in the

municipal world and therefore often the basis of research. It is easier to compare G.O. bonds against each other since they all have similar backing: full taxing power of the issuing municipality. We attempt to isolate insured from uninsured bonds, but have encountered some data gathering/cleaning issues. Figure 1 therefore must be viewed with a large caveat: the insured bonds category may not be capturing all insured bonds.

When we examined trading results, we realized that the data did not necessarily match the dates we thought significant and hence let the dates and jumps in the data tell their own story. The solid lines in Figure1 show the average bond yield difference between the previous 30 days and following 30 days for each group. Gaps in the data appear when trading volume was too low to produce significant results.

Movements in insured bond prices closely track movements of all municipal bonds. Large movements occur first when Northern Rock foundered, then again when negative subprime news came out, and when Lehman went bankrupt. The market also reacted when the insurers' started to be downgraded. These results highlight that the municipal market as a whole reacted negatively to the financial troubles of the financial guaranty industry. The market seems to have realized quickly that the death or terminal illness of an industry that played such a major role would cause market dislocation.

Besides identifying jump dates during the height of the crisis, we compile available information (SIFMA) to look at how insured bonds performed in 2011 versus the municipal bond index (Figure 2). Total returns on insured bonds are higher than for the index for most of the year. We also compare yields on AA bonds to insured bonds, controlling for bond tenure (Zion's Direct). As can be seen in Figure 3, yields on insured bonds were higher than those on AA bonds, with the difference most pronounced for the short and long tenured bonds.

Then to see whether the spread inversion phenomenon has lessened as the markets have stabilized, we compare 2010, 2011, 2012. We use August data since that was the most recent available for 2012, and thought it best to compare the same month each year to adjust for any seasonal in issuance/trading patterns. Figure 5 shows that insured bonds performed worse in 2011 than 2010, but that the pattern started to reverse in 2012.

All evidence supports a hypothesis that bound insurance has become a liability. We then turn to one specific sector as a robustness check of our results.

#### FOCUS ON NOT-FOR-PROFIT HOSPITAL SECTOR

We decided to focus on the on Not-for-Profit Hospital Sector for a number of reasons. Firstly, to effectively isolate the effect of any event, it is better to study a sample that should react similarly to other outside stimuli. Bonds in this sector should react similarly to changes in the health care landscape (Medicaid, Medicare changes).

Secondly, this is an area of great interest, as healthcare and health care costs are an area of major concern in our economy. Additionally, previous research (Gershberg, Grossman, & Goldman, 2000) examined the cost of capital in this market. And lastly, but definitely not least, prior research provides

some of the data needed for our analysis. As pointed out by Huang et al. (Huang, Cohen, & Eappen, 2012), not-for-profit hospital bond issuance declined 17% in 2011, continuing the trend of declining issuance which began in 2009. Obviously, a portion of this can be attributed solely to the overall financial downturn, but when we look at the details as we can at least conjecture that it is in part due to the lack of bond insurance in the market. 2008 was noted for refunding into less complex, more conservative debt: the Auction Rate Securities market which supported more complex variable rate structures fell apart in February 2008 (Selinger, 2009).

In the decade leading up to 2011, there were bond issues of \$500 million or greater each year; none were this large in 2011. Bond insurance has traditionally played a role in these larger issues, providing liquidity. Lower rated hospitals, again an area that benefitted greatly from insurance, are facing wider yields relative to higher rated hospitals: the yield differential between BBB and AA averaged 52 basis points between 2002 and 2006 versus 1.15 basis points 2007 – 2011. For 2011 alone the differential was 137 basis points.

When we concentrate on the insured market versus the uninsured, our area of primary interest, we see dramatic movements. The 5 year average for 2002- 2006, insured bonds versus AA bonds, was a negative 28.26 bps while the 5 year average for 2007- 2011, insured bonds versus AA bonds was a positive 6.16 bps. For 2011, AA bonds on average had spreads that were 43.54 basis points lower than insured bonds. (Huang, Cohen, & Eappen, 2012)

#### **REASONS FOR YIELD REVERSALS**

From (Liu, 2011)'s results, the financial guarantors would have had some motivation to pick the weakest bonds among each rating category, since their capital charge would be the same for similar bonds within the same rating category, their return on capital would be higher for the riskier bonds:

$$R = \frac{p * a}{c}$$

In the above simplified equation of a financial guarantor's return model, R represents return: p is premium, a is par amount of the insured bonds and c is capital charge assessed by the rating agency. Clearly, if the insurers could get a higher p for the same c, their financial results, at least in the short term, would improve.

Another possible reason for insured bonds trading wider than uninsured after the insurers were downgrade could be the restrictions many funds have on their holdings based on ratings: these funds would have been forced to liquidate a high proportion of their no longer AAA/Aaa insured bonds. Additionally, the control that the insurer has over the bonds it insures could be viewed negatively. While investors were protected by AAA/Aaa enhancement, and the insurers were solvent companies desirous of doing further business, the interests of the two groups should have roughly been aligned. With the insurers fighting for survival, the will in most cases make payments as far out as legally possible, which may be the exact opposite of what benefits investors.

Moody's (Pierog, 2012), stated that municipalities might be strategically defaulting on insured bonds, signaling a changing attitude towards insurers. Previously, while the insurers were strong and writing new business, municipalities might have been more willing to work with the insurers in determining solutions to problems, but this attitude may be changing. Stockton, California has publicly stated that it would not protect bondholders exclusively (Nolan & Cherney, 2012).

## CONCLUSION/CAVEATS

Both other research cited and our work show that insured bonds have suffered since the crisis. The why is less clear cut, but perhaps the real question is what was/is the value of insurance. Before the crisis there clearly was value from both a trading perspective and probability of default. Post the downgrades of the insurers, those who chose insured bonds for their portfolios are not benefitting. Some funds were forced to sell into an illiquid market at undesirable prices; liquidity is still weak.

Our and others' research can only look at bonds which were traded. Results by necessity therefore only reflect a portion of the market. Many municipal bonds, especially insured bonds, were sold to retail investors and therefore the trading is limited. Many other factors were changing at the same time; parsing out causality is very difficult.

## ENDNOTE

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# APPENDIX

# SOURCE: Bloomberg data on bond trades



Zions Direct Municipal Bond Market Snapshot for Week Ending August 24, 2012. (n.d.). Retrieved September 10, 2012, from http://finance.yahoo.com/news/zions-direct-municipal-bond-market-210200323.html



# Figure 3: August 2012 Yields; AA Bonds and Insured AAA-AA Bonds





Figure 4: AA Bonds and Insured AAA-AA Bonds

Source: Zion's Direct Auction Information

### Table I: Insured versus Muni Bond Index (Source: SIFMA: S&P)

Insured Bonds Total Return	Municipal Bonds Total Return
1.906	1.959
0.463	0.636
-0.299	-0.452
1.251	0.789
1.76	1.655
1.165	1.009
0.431	0.231
2.068	1.731
2.003	1.939
-0.45	-0.349
1.735	1.926
-1.067	-0.636
-2.22	-1.788
	Insured Bonds Total Return 1.906 0.463 -0.299 1.251 1.76 1.165 0.431 2.068 2.003 -0.45 1.735 -1.067 -2.22

# Do College Textbooks Cover All Categories Of Market Failure?

# L. Chukwudi lkwueze<sup>\*</sup>

#### ABSTRACT

The 2007 financial crisis, which began in the United States, has brought with it an increased interest among students in the topic of market failure. Although professors have responded by allocating extra time to teaching the subject, assigning textbooks with adequate information can be an effective pedagogical tool too. Thus this paper reviews the content of college textbooks focusing on market failure. The author surveys an undergraduate economic program, identifies four courses, including introductory microeconomics, international economics, money and banking, and finance, and then reviews selected textbooks on the four courses. This paper presents the review findings and some suggestions.

#### INTRODUCTION

A market is a mechanism through which buyers and sellers interact to set prices and exchange goods and services (Samuelson et al., 2001). A market works efficiently in a situation in which interaction between buyers and sellers, left on its own, results in efficient allocation of resources. But a market does not always work efficiently. When a market fails to work efficiently, it results in a market failure. A market failure is therefore a situation in which a market, left on its own, fails to allocate resources efficiently. More specifically, a market failure occurs when the activity of individuals, businesses, or governments imposes extra costs or benefits on a market, resulting in the inefficient allocation of resources (McConnell et al., 2009).

Following the 2007 financial crisis and the increased interest among students in finding out the causes of the crisis, many professors, including the author, have been allocating extra time to teaching issues of market failure. Convinced further that students can potentially become better economic managers, especially with respect to preventing and combating financial crisis, if they have a better understanding of the subject. The author conducted a survey of an undergraduate economics program to identify courses that cover the subject matter and the following four courses were identified1:

Principles of Microeconomics focuses on the theory of demand and supply, production and costs, allocation of resources, and also product and factor pricing. The key course objectives are acquiring a basic knowledge of economic society, from the vantage point of the individual and specific components, or micro-economy; also attaining a greater understanding as to how income is distributed (and redistributed) within the economy. International Economics covers why and how countries trade with each

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other. The key course objectives include acquiring a basic knowledge of international economic system, from the vantage point of trade, trade blocks, and specific institutional framework, comprehending the role of national economic system in a global economy. Money and Banking studies the process of financial intermediation in the economy, with primary focus on the role of money and banking. The key course objectives include understanding the economy, from the vantage point of money, banking, and specific components of financial system. Finance covers the basic principles, instruments, and institutions in the financial market place. The key course objectives include having knowledge of the impacts of financial market place on the economy.

Then, textbooks on the four courses were selected to find out how they cover the subject of market failure. The author selected the textbooks based on the following criteria (many schools/departments use the same criteria): (1) a textbook was published by the 10 best U.S. publishers or their affiliates, and (2) a textbook was published by a Nobel laureate, professor in any of the 100 best U.S. ivy schools, or professor who acted in an official advisory position in the three arms of the U.S. government. Based on the criteria, only sixteen textbooks, equally selected from the four courses, were reviewed. This paper presents the review findings and some suggestions.

#### **TEXTBOOK REVIEW FINDINGS**

#### **FIRST FINDING**

The author found a total of eight theories of market failure upon reviewing the sixteen textbooks. Below is a brief description of the theories:-

Creative destruction- A creative destruction refers to the hypothesis that the creation of new products, production methods, and management techniques can simultaneously make existing markets obsolete, thereby resulting in the failure of the now obsolete markets.

Distortional price-The theory of perfect competition assumes that a market price provides signals as to the benefit and cost of a resource, good or service. If a price is slow to adjust, then the proper signal such a price communicates does not happen quickly, and coordination of demand and supply can break down; possibly, a market failure can occur.

Public good- The theory of perfect competition assumes that a good possesses the features of rivalry and excludability, meaning that when one person buys a good, it is no longer available for another person, and also that sellers can keep people who do not pay for a product from obtaining benefits, respectively. Instead, a public good possesses two features of nonrivalry and nonexcludability, meaning that one person's consumption of a good does not preclude consumption of the good by others, and also that there is no effective way of excluding a person from the benefits associated with consuming of the good, respectively. The existence of a public good implies a case of market failure because a public good cannot be produced if left entirely to the signals of the market.

Market power- The theory of perfect competition assumes that if a firm can sell a good (note that all firms sell standardized goods) and sets a higher price than other competitors, the firm loses customers to

the now cheaper identical good in the market. If a firm sets a higher price and still remains in the market, then it possesses a market power, which is a state of market failure. All forms of imperfect competition such as monopoly, monopolistic competition, and oligopoly (prisoner-dilemma) firms have a market power.

Asymmetric information- The theory of perfect competition assumes that free availability of information is critical in an efficient market. Informational asymmetry occurs where a buyer or seller has much more information about a good than the other party. If one party possesses more information than the other about a good, a market failure can occur.

Government failure- When a government fails to perform efficiently its statutory, market-related responsibilities a market failure can occur. This can occur if some extra costs or benefits are imposed on a market because a government enabled special-interest groups, shortsighted political behavior, limited and bundled choices, bureaucratic inefficiencies, or the deployment of economic policy.

Market externality- The theory of perfect competition assumes that costs or benefits related to producing a good are fully absorbed and distributed between the buyers and sellers in a market. Sometimes, in some markets, the costs or benefits related to producing a good can spillover onto a third party or bystander. This is considered a case of market failure because the activities of market participants impose extra costs or extra benefits on a third party or bystander.

Inequality of income-The theory of perfect competition assumes a market rewards a person according to his or her ability to produce goods that others are willing to pay for. Those who are not capable of producing goods are likely to not make ends meet. This means that an efficient market may fail to ensure that economic prosperity gets to everyone equitably. A recent study (Birdstall, March/April 2007) suggests that lack of equitable distribution of income throughout the economy can cause a market failure.

#### SECOND FINDING

The author found that individual textbooks on the four courses unevenly covered the eight theories. Tables 1 to 4 show how each of the sixteen textbooks cover the eight theories:

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Textbook	Case, K. E., Fair, R.C. Oster, S.M.,	Krugman, P., Wells, R.	McConnell,C.R., Brue, S.L., Flynn, S. M.,	Mankiw, N.G.,
Source of Market Failure	Principles of Microeconomics <sup>1</sup>	Microeconomics <sup>2</sup>	Microeconomics <sup>3</sup>	Principles of Microecono mics⁴
Creative Destruction	n X	Х	√*	Х
Distortional Price	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Market Power	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Government Failure	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Public Good	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Market Externality	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Informational Asymr	netry 🗸	$\checkmark$	$\checkmark$	$\checkmark$
Inequality of Income	× X	$\checkmark$	$\checkmark$	$\checkmark$

Table 1.	Microeconomics	Textbooks on	the Fight	Theories
Table I.				111601163

<sup>1</sup> 9e, Pearson Prentice-Hall, 2008., <sup>2</sup> 2e, Worth Publishers 2009., <sup>3</sup>18e, McGraw-Hill Irwin, 2009.,

<sup>4</sup>5e, Thomson South-Western, 2008. \* The concept was not presented as a theory of market failure.

Table 1 shows how four microeconomics textbooks cover the eight theories of market failure. As indicated in the table, three of the microeconomics textbooks cover seven of the eight sources of market failure. Only the text by McConnell et al. (2009), discusses all the eight sources of market failure, although the issue of creative destruction was not explicitly presented as a source of market failure.

Textbook	Krugman, P., Ohstfeld, M	Pugel, T. A.,	Carbaugh, R.J.,	Sawyer, W.C., Sprinkle, R. L.,
Source of Market Failure	International Economics:	International Economics <sup>2</sup>	International Economics <sup>3</sup>	International Economics <sup>4</sup>
	Theory & Policy <sup>1</sup>			
Creative Destruction	Х	Х	Х	Х
Distortional Price	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Market Power	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Government Failure	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Public Good	$\checkmark$	$\checkmark$	Х	Х
Market Externality	$\checkmark$	$\checkmark$	Х	Х
Informational Asymme	try 🗸	$\checkmark$	$\checkmark$	Х
Inequality of Income	· •	Х	Х	Х

TABLE 2: International-Economics Textbooks on the Eight Theories

<sup>1</sup>8e, Pearson Addison Wesley, 2009, <sup>2</sup>14e, McGraw-Hill Irwin, 2009, <sup>3</sup>Thomson South-Western, 2005, <sup>4</sup> 3e, Prentice Hall, 2009.

Table 2 shows how international-economics textbooks covered the eight theories3 of market failure. As indicated in the table, the four textbooks extensively covered the issue of government failure. This finding is understandable because governments and regional economic unions such as European Union (EU) or North America Free Trade Association (NAFTA) often build fiscal policy and other protective barriers against nonmembers. Also, notice that the textbooks covered the issue of market power. This is also understandable because most multinational corporations that operate globally have some

measurable level of market power. Further, the textbooks covered the issue of distortional price in a market economy. The textbooks by Pugel (2009) and Krugman et al. (2009) covered the issue of moral hazard, but none of the textbooks covered the issue of adverse selection; only Krugman et al. (2009) covered the issue of inequality of income.

TABLE 3: Money-and	d-Banking Textbooks C	on the Eight Theories	i	
Textbook	Croushore, D.,	Ritter, L.S., Silber, W.L., Udell, G.F.,	Pesek, B.P.,	Cecchetti, S.G., Schoenholtz, K.L
Source of Market Failure	Money & Banking: A Policy-Oriented Approach <sup>1</sup>	Principles of Money, Bank- ing, & Financial Markets <sup>2</sup>	Microeco- nomics of Money & Banking & Other Essays <sup>3</sup>	Money, Banking, & Financial Markets <sup>4</sup>
Creative Destruction	Х	Х	X	Х
Distortional Price	$\checkmark$	Х	$\checkmark$	$\checkmark$
Market Power	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Government Failure	$\checkmark$	$\checkmark$	Х	$\checkmark$
Public Good	$\checkmark$	$\checkmark$	$\checkmark$	Х
Market Externality	$\checkmark$	$\checkmark$	Х	$\checkmark$
Informational Asymm	etry ✓	$\checkmark$	$\checkmark$	Х
Inequality of Income	$\checkmark$	Х	Х	Х

TADLES MAN		<b>T</b> . <b>A</b> . <b>A</b> .	d . E'. L ( TL	
IABLE 3: WONE	y-and-Banking	Textbooks on	the Eight Theor	ies

<sup>1</sup>1e, Houghton Mifflin, 2007. <sup>2</sup>11e, Pearson Addison Wesley, 2004., <sup>3</sup> University Press, New York, 1988., <sup>4</sup> 3e, McGraw-Hill Irwin, 2011.

**Table 3** shows how money-and-banking textbooks covered the eight theories of market failure. As the table shows, only three textbooks covered the issues of informational asymmetry, market externality, and the distortional price. The coverage of these three theories is understandable: Informational asymmetry, in form of moral hazard and adverse selection, is prevalent in the banking sector; market externality occurs in the banking sector, for the effect of poor banking practices or better banking practices can spill over onto other banks or citizens; the inclusion of distortional price was because the author found statements to the effect that bank products may not always reflect their efficient-market value. Although modern banks are mostly monopolies, oligopolies or monopolistically competitive firms, we found no coverage in the textbooks of the issue of market power (too big to fail). Only the textbook by Croushore (2007) briefly discussed how the banking industry can promote income inequality under the topic of redlining- a practice whereby banks refuse to make loans to people that live in poor neighborhoods. None of the four textbooks covered the issue of creative destruction, even though there is a fierce competition among banks that result in products and, sometimes, business failures.

Textbook	Melicher, R.W., Allen, F., Norton, E.A.,	Meyers, S.C., Brealey, R.A.,	Maurice, D.L.,	Bodie, Z., Kane, A., Marcus, A.J.,
Source of Market Failure	Principles of Finance, Markets, Investments, & Financial Management <sup>1</sup>	Principles of Corporate Finance <sup>2</sup>	International Finance <sup>3</sup>	Essentials of Investments <sup>4</sup>
Creative Destruction	x	Х	Х	Х
Distortional Price	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Market Power	Х	Х	$\checkmark$	$\checkmark$
Government Failure	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Public Good	Х	Х	Х	$\checkmark$
Market Externality	Х	Х	Х	Х
Informational Asymmetry	$\checkmark$	Х	$\checkmark$	Х
Inequality of Income	Х	Х	Х	Х

**TABLE 4:** Finance Textbooks on the Eight Theories

<sup>1</sup>13e, John Wiley & Sons Inc., 2008., <sup>2</sup> 8e, McGraw-Hill Irwin, 2006., <sup>3</sup>5e,Rouledge,Taylor & Francis Group,2005. <sup>4</sup> 8e. McGraw-Hill Irwin, 2010.

**Table 4** shows how finance textbooks covered the eight theories of market failure. As indicated in the table, the four textbooks covered the issue of distortional price perhaps because the prevailing prices of financial products in general do not reflect the actual value of the products. Understandably, the textbooks covered the issue of government failure because financial institutions face risks from government regulatory activity. Even though financial institutions operate in a very competitive environment, none of the textbooks covered the issue of creative destruction because financial institutions operate in a very competitive industry. As indicated in the table, only Melicher et al. (2008) and

Maurice (2005) covered the issue of information asymmetry even though there is always a possibility that parties to a market transaction in the financial industry are regularly exposed to the incidence of moral hazard or adverse selection. Further, while there is no doubt that major financial institutions are mostly monopolies, oligopolies or monopolistically competitive firms, only Maurice (2005) and Bodie et al. (2010) covered how having market power can affect a market. None of the textbooks covered the issues of market externality and income inequality, even though financial transactions can affect nonmarket participants and contribute to the income inequality in the economy, respectively.

# THIRD FINDING

None of the textbooks cover certain sources of market failure occurring when individuals, businesses, or governments are engaging in activities outside a market transaction. For example, a recent report (Anders, 2007) showed that private remittances by immigrants to family members can reduce poverty as well as increase creditworthiness of countries and underwrite their trade imbalances. Another observable source of market failure is the activity of Internet hackers that increasingly imposes extra costs on

providers and customers alike. On the business level, the rent-seeking activities of businesses can cause a market failure. A recent study estimated the economy-wide cost of lending to firms with political connections in Pakistan to be between 0.3% and 1.9% of Pakistan's gross domestic product (Khwaja et al., 2005). On the government level, the extrajudicial activity of government can cause a market failure. The 2010 Human Rights Watch reports on Nigeria reveals that 1,350 illegal police roadblocks were mounted during a period of 18 months. The reports shows that police officers received millions of dollars from citizens, frequently threaten victims, and commit human rights abuses.

# PEARSON CHI-SQUARE AND FISHER'S EXACT TESTS OF INDEPENDENCE

Next the paper presents the Pearson chi-square and Fisher's exact tests of independence to determine if the difference between the expected (eight theories plus omitted sources of market failure) and observed (actual number of theories covered in individual textbooks) data is due to a sampling error.

To perform the tests, the author aggregated the data from Tables 1 to 4, above, by adding together the total number of times the eight sources of market failure were covered in individual textbooks for each course, as shown in Table 5.

TADLE J. NUMBER OF		overed the Light i	neones			
Courses	Microeconomics	Money and	International	Finance	Row	
		Banking	Economics		Totals	
Source of						
Market Failure						
Creative Destruction	1	0	0	0	1	
Distortional Price	4	3	4	4	15	
Market Power	4	4	4	2	14	
Government Failure	4	3	3	1	11	
Public Good	4	3	3	1	11	
Market Externality	4	2	2	0	8	
Informational Asymm	etry 4	3	3	3		
				13		
Inequality of Income	3	1	1	0	5	
Column Totals	28	19	20	11	78	

Thus the author conducted both tests based on same null and alternate hypothesis:

H<sub>o</sub>: Expected eight theories and the actual theories in individual textbooks are independent.

H<sub>A</sub>: Expected eight theories and the actual theories in individual textbooks are not independent.

The Chi-square can be used to test for independence between two variables using counts for the response variable. The Fisher's exact test can be conducted if the Chi-square result is deemed misleading or unreliable and the following conditions apply: (1) when one of the cells in the table is less than 5, and especially when it is less than 1, (2) the marginal totals of the observed table are fixed, and (3) if the null hypothesis is true. Clearly the first two conditions apply in this case for the cells in Table 5 have less than 5 observations and the marginal totals of the observed table are fixed. To find out if the third condition also applies, performing both tests using the IBM SPSS software, the author presents the results of the tests in Table 6 and then the interpretation of the results follows after.

	Value	df	Asymp.	Exact Sig.	Exact Sig.	Point
			Sig. (2-sided)	(z-sided)	(1-sided)	ility
Pearson Chi-Square	8.864 <sup>a</sup>	21	.990	b		
Likelihood Ratio	10.421 10.421	21	.973	.993		
Fisher's Exact Test	9.182			.999		
Linear-by-Linear Association	1.134 <sup>°</sup>	1	.287	.301	.151	.012
N of Valid Cases	78					

#### **TABLE 6:** Results of the Pearson Chi-square and Fisher's Tests

a. 30 cells (93.8%) have expected count less than 5. The minimum expected count is .14.

b. Cannot be computed because there is insufficient memory.

c. The standardized statistic is -1.065.

#### INTERPRETATION OF THE CHI-SQUARE AND FISHER'S EXACT TEST RESULTS

The degrees of freedom of 21 (degrees of freedom= (c-1)(r-1) = 3(7)= 21) indicate the number of values that are free to vary after restrictions has been placed on the data. The table value for the degrees of freedom of 21 at the level of significance of p= .05 equals 32.6714.

Because the chi-square test result is 8.86 and the degrees of freedom is 21, which is 32.671 for alpha=0.05, then the null hypothesis is true. This means that that the relationship between the expected eight theories plus omitted sources of market failure is independent of the actual theories in individual textbooks. Thus, with the high p-value of 0.990, we can conclude that the distribution of the data was due to chance 99% of the time, implying that the eight theories were not fully covered in individual textbooks. Equally, in Table 6, the Fisher's exact test p-value of .999 means that there is no significant relationship between the coverage of the eight theories and the actual number of theories in individual textbooks.

#### CONCLUDING REMARKS AND SUGGESTIONS

This paper showed that college textbooks have not been covering all categories of market failure. The author found, across the sixteen selected textbooks, a total of eight theories of market failure; individual textbooks did not even cover all the eight theories; none of the textbooks covered some potential sources of market failure like Internet hacking, corporate lobbying, and extrajudicial activity of government. Further, the author conducted both the Pearson chi-square and Fisher's exact tests of independence, using the IBM SPSS software to analyze the data generated from the review. Both results confirmed equally that individual textbooks did not cover all categories of market failure.

Yet, covering all categories of market failure in textbooks on the courses can be helpful to students. In particular, it can help students not only understand the workings of the sectors covered in the courses, but also the potential pitfalls that can undermine them. Therefore the author suggests that textbooks on the four courses be required to show how the divergent economic sectors covered in the courses contribute to the incidence of creative destruction, distortional price, informational asymmetry, market power, market externality, public good, government failure, and inequality of income.

The good news is that this suggestion is economical for it can be applied at little or no costs. Based on the author's familiarity with the textbooks, a full chapter or selected sections of selected chapters can be used to present the topic areas without increasing their volume. An even more important reason this suggestion merits further consideration is that students taking these courses may turn out to become better economic custodians, especially with regard to preventing and combating financial crisis, because of the knowledge they acquire in the courses, if presented as being suggested.

In all, there are two ways schools can help ensure that students taking the courses obtain full knowledge of market failure. First they can elect to adopt only textbooks that evenly cover all categories of market failure as they relate to particular courses. Secondly they can encourage professors to cover all categories of market failure in their class, regardless of the content of the assigned textbook. If these suggestions are implemented, they can potentially spur both textbook authors and professors to adequately cover all categories of market failure for their students.

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# ENDNOTES

- Only the four courses were selected because others undergraduate economic or business courses either cover the same theories or variants of the same them. For example, usually, the eight theories are covered in principles of microeconomics, but only their mathematical applications of a few of them are covered in intermediate-level microeconomics.
- The courses' objectives were contained on the syllabi approved for the author at the Departments of Economics and also Business and Accounting at Pace University and Touro College in New York, respectively.
- 3. Only variants of the theories were covered in textbooks on international economics, money and banking, and finance. For example, in money and banking, the author identified 'contagion' which refers to a spillover effects from a bank failure to other banks and entities as a variant of the theory of market externality.
- 4. The author can provide a separate table showing only the results of the Pearson chi-square test of independence.

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# How Nonmarket Participants Cause Market Failures: A Conceptual Perspective

# L. Chukwudi Ikwueze<sup>\*</sup>

#### ABSTRACT

Existing theories of market failure hinge on the premise that only market participants can cause a market failure, implying thereby that nonmarket participants cannot. Nonmarket participants are individuals, businesses, and governments that engage in any activities outside a market transaction; such activities include charity giving, Internet hacking, and corporate lobbying. The goal of this paper is to show that nonmarket participants can cause a market failure. It first explores the theoretical basis of nonmarket participants as a source of market failure. Then the paper estimates the effects of lobbying and Internet hacking on the U.S. banking and e-commerce sectors.

#### INTRODUCTION

An efficient market is based on the theory of perfectly competitive equilibrium. The perfectly competitive equilibrium is directly related to the state of Pareto-optimality in economics. Pareto-optimality implies a state of equilibrium where no move can be made to make one person better-off without making someone else worse-off. However a market does not always work according to the perfectly competitive theory. When a market fails to work perfectly or efficiently, it results in a market failure.

In the literature, the term for the theory which deals with the allocation of resources under a state of a market failure is the "second-best theory," the vital assertion of which is that a market failure occurs if there is any deviation from the assumptions of perfectly competitive equilibrium. This means that any single deviation from the assumptions of the perfectly competitive equilibrium is synonymous to a market failure. Such deviations (Lipsey et al, 1965-67) include the following: existence of monopoly (single seller) or monopsony (single buyer) power of one household over others in the economy; the presence of externalities and public goods; informational asymmetries most commonly found in the context of uncertainty having different impacts on different households; savings, which is excluded in the pure competitive model; price regulation by government can cause enormous dislocations in the perfectly competitive model; an important sector of inefficiency in any national economy-the defense sector is outside the market sector; no unemployment of resources is foreseen in the perfectly competitive model.

There are two key ways that the deviations can occur. One, they can occur due to the vagaries of nature (Michel-Kerjan, E.O., 2010), for example, flooding or droughts can cause economic collapse. Other than that, conceptually speaking, the only other way the deviations can occur is due to the activities

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of individuals, businesses, and governments occurring when they are engaging in a market transaction or outside a market transaction. Next, having clarified the theoretical root of market failure, the author reviews the literature to find out how the topic of market failure is being covered.

#### **BRIEF LITERATURE REVIEW**

#### I. MARKET PARTICIPANTS AS CAUSE OF MARKET FAILURE

A review of the available literature reveals the following theories of market failure: creative destruction, market power, distortional prices, informational asymmetry, public goods, government failure, inequality of income, and market externalities. The creative destruction refers to the hypothesis that the creation of new products, production methods and management techniques by competing firms simultaneously makes existing markets obsolete, ultimately resulting in market failures. (See: Caplan, 1996;Thesmar et al, 2000). Having a market power can cause a market failure (Mankiw, 2004) if a firm sets a higher price for its product and still remains in the market. This means that the firm which possesses the market power is the cause of a market failure. A price distortion can cause a market failure because, if a price is slow to adjust (Sheedy, 2007) and (Mankiw, 1985) the coordination of demand and supply can break down. Further, an informational asymmetry can occur (Stiglitz, 2000) if a buyer or seller has much more information about a product than the other market participant. The mere existence of public goods in the economy implies a case of market failure (Sexton, 2011) because sellers would not invest in a market in which there is no effective way of excluding a person from the benefits associated with consuming of the product.

A government is considered a market participant because it performs market-related and systemic roles in the economy. A government failure occurs when it fails to efficiently perform the assigned roles. The text (Case et al, 2008) covers issues of government failure extensively. Market externalities (McConnell et al, 2009) can occur if market participants impose extra costs or extra benefits on a third party or bystander. The lack of equitable distribution of income in the economy (Stiglitz, 2013) can cause a market failure. The above review shows that existing theories of market failure hinge on the premise that only market participants can cause a market failure; this contrast markedly with the conceptual viewpoint that nonmarket participants too can cause a market failure.

#### **II. NONMARKET PARTICIPANTS AS CAUSE OF MARKET FAILURE**

To better reflect how nonmarket participants affect a market, instead of using the term market failure, the rest of the discussion focuses on the novel concept of market internality1 which is a term coined by the author to represent any market failure caused by nonmarket participants. Market internalities can manifest in the economy in two ways: negative and positive.

#### **NEGATIVE INTERNALITIES**

Negative internalities occur when nonmarket participants affect the efficient allocation of resources by imposing extra costs on a market while engaging in any activities outside a market transaction. An example of activities that can cause a negative internality is Internet hacking. According to Google's management, the search-engine firm considered pulling out of China because of the activities of hackers in China. If Google were to make real this threat, according to (Hogg, 2010) the search-engine market in China may drop by more than 25% which is more or less the ratio of the market controlled by Google in China. Yet another example of negative internality can be the activity of corporate lobbyists. Many interest groups spent millions of dollars lobbying for or against the U.S. health care bill. For example the U.S. Chamber of Commerce spent an amount of \$62.2 million opposing the passage in 2010 of the U.S. health care bill. These diverse groups engage in lobbying only because they expect to receive some benefits that they cannot get through the market.

# **NEGATIVE INTERNALITIES**

FIGURE 1.2: shows how negative internalities affect efficient allocation of resources in a market:



**Negative Internalities** 

**Figure 1.2** shows that when a firm incurs some extra costs resulting from a nonmarket participants, the supply curve *St* lies farther to the left (or above) than it would if the extra costs resulting from negative internalities were not taken into account. This means that *St* includes extra costs from a nonmarket economic agent and *S* does not. The market supply reflects both direct private costs and extra costs and therefore overstates total costs and understates total benefits. The outcome is shown in **Figure 1.2** where equilibrium output *Qt* is less than optimal output *Qo*. The result is that the market under produces the good or service, and resources are under allocated. The price of the good is too high and the output of

the good is too low to be at efficient-market level Qo. As a result, market failure occurs in the form of under allocation of resources to the production of the good.

# **REMEDIES TO NEGATIVE INTERNALITIES**

There are three distinct ways to correct the market disequilibrium associated with negative internalities. First, affected entities can buy insurance policies against exposure to market-internality problems. There is a similar suggestion (Michel-Kerjan, 2010) in a recent article, discussing how to use the insurance tool to contain catastrophic events such as natural disasters and acts of terrorism. Second, a special legal platform, which might operate in the same way as the U.S. small-claims court, should be put in place for entities facing the challenges of negative internality. According to (Glaeser et al, 2011) the efficacy of whether to use a legal or a regulatory platform should depend on the incentives facing judges and regulators. Third, government can extend tax holiday, subsidies, or direct controls to compensate entities facing problems of negative internalities.

# **POSITIVE INTERNALITIES**

FIGURE 1.3: shows how positive internalities affect efficient allocation of resources in a market:





Positive internalities occur when individuals, business, and governments affect the efficient allocation of resources by imposing extra benefits on a market while engaging in activities outside a market transaction. An example of activities that can cause a positive internality is the impact of development assistance rendered by developed nations' agencies to developing countries. In Haiti, USAID recently helped trained 1000 bee farmers who had earlier abandoned the trade, so that they could return to raising bees to earn a living. What the USAID Farmer to Farmer Program, administered by Partners of the Americas, did was teach Haitian beekeepers " hive construction, including size of the main structure, lids and proper wood sources... after the Farmer to Farmer program began its work, more than 1,000 beekeepers returned to raising bees and more than 300 hives were restructured. Honey production has

increased from three to seven gallons per hive, generating significant income for Haitian beekeepers. In addition, beekeepers are now communicating with each other and forming beekeeping associations, recognizing the need to organize in order to increase profits and reduce costs."

#### **POSITIVE INTERNALITIES**

**Figure 1.3** shows that when a business earns some extraneous benefits resulting from the activities of nonmarket participants, the market demand curve Dt lies more to the right (or above) than it would if the extra benefits were not taken into account. This means that Dt includes extra benefits from the activities of nonmarket economic agents and D does not. The market demand reflects both the private and extra benefits and therefore overstates total benefits and understates total costs. The outcome is shown in **Figure 1.3** where equilibrium output Qt is larger than optimal output Qo. The market over produces the good or service, and resources are over allocated. The price of the good may be high, the same or low, depending on the exact source of positive internalities; and the output level may be too high compared with the efficient-market level Qo. Thus, a market failure can occur in the form of over allocation of resources to the production of the good.

#### **REMEDIES TO POSITIVE INTERNALITIES**

There are two distinct ways to restore market equilibrium should the positive internalities persist in a market. First, government can adopt the tactics of "moral suasion" by encouraging individuals or firms to invest some of the extra benefits in vital societal ventures. Second, government may impose one-time taxes on the individuals or firms that enjoy extra benefits and then use the revenues to fund vital societal ventures.

#### A FRAMEWORK FOR ESTIMATING NEGATIVE INTERNALITIES

#### (a) REGRESSION ANALYSIS, THE PROCEDURE:

The regression analysis also referred to as the method of least square, according to businessdictionary.com, is a statistical approach to forecasting change in a dependent variable on the basis of change in one or more independent variables. Relationships depicted in a regression analysis are however associative only, and any cause-effect (causal) inference is purely subjective. The process involves fitting a curve or straight line to data points, in a manner such that the differences in the distances of data points from the curve or line are minimized. With one independent variable, referred to as linear regression, the best-fitting line can be interpreted by the formula for determining a slope.

Yt = a + bX + e; where Y is the observed score on the dependent variable, a is the intercept, b is the slope, X is the observed score on the independent variable, and e is the error or residual.

In the case where the number of independent variables is more than one, the linear regression equation can extend into such a multiple regression equation: Yt = a + b1X1 + b2X2 + ... + bkXk + e; where there are independent variables (ks) and a slope for each (bs), one error (e) and one intercept (a).

The multiple regression hypotheses are these: HO: b1 = b2=...= bk = 0; HA: At least one b is not zero

# (b) REGRESSION ANALYSIS:

#### LOBBYISTS AND INTERNET HACKERS VERSUS U.S. BANKING AND E-COMMERCE SECTORS

Lobbyists according to the Center for Responsive Politics, make campaign contributions to elected officials and candidates, companies, labour unions, and other organizations spend millions of dollars each year to lobby Congress and federal agencies. Some interests retain lobbying firms, many of them located along Washington's legendary K Street; others have lobbyists working in-house. The total spending by lobbyists in 2012 was \$12.47.

Internet Hackers according to an independent study conducted by the Ponemon Institute are mainly motivated by financial fraud, followed by customer data theft, and disruption of business operation. The losses resulting from cybercrime include costs of complying with consumer notification laws; costs of providing credit monitoring for affected individuals; costs of responding to any government investigations and any resulting fines; costs of the loss of intellectual property and damage to, or suspensions of, their online systems and resulting business interruptions; and costs of litigation, as well as potential judgements or settlements, in connection with third-party lawsuits brought by persons whose data has been compromised. In 2012, the Institute reports that the average annualized cost of cybercrime for 56 benchmarked U.S. firms range from \$1.4 million to \$46 million per year.

The U.S. banking and e-commerce sectors have undergone tremendous change in the last two decades. Notable factors that have driven the change are as follows: the Savings & Loans crisis of the early 1990s, the repeal of Glass-Steagall Act in 1999, terrorist attacks in 2011, fierce competition due globalization and deregulations, outsourcing, challenges to operating online, and the financial crisis of 2007. During this period, there has been noticeable increase in the operating expenses for the two sectors, so it is of interest for the benefit of this study to find out how lobbyists spending and costs associated with Internet hacking contributed to the operating expenses in both sectors The author uses the MINITAB software to perform a multiple regression analysis on ten years of data to determine the significance of lobbyists' spending and costs of Internet hacking on the operating expenses for the U.S. banking and e-commerce sectors.

In Tables 2, the regression equation is this: Operating Expenses = 5.98E+11 – 731 Lobbyists + 1630653 Hackers. The Operating Expenses variable, dependent variable, is dependent on independent predictors that are, X1= Lobbyists, X2 = Hackers. This regression equation indicates therefore a negative relationship between Operating Expenses and Lobbyists' spending, and a positive relationship between Operating Expenses and Lobbyists' spending, and a positive relationship between Operating Expenses and Lobbyists' spending, and a positive relationship between Operating Expenses of Lobbyists' spending the operating expenses of the banking and e-commerce sectors decrease by \$731 thousands; the positive coefficient of 1630653 indicates that for every increase in one percent of Hackers' costs the Operating Expenses would increase by \$1630653;

while the Operating Expenses would increase by a factor of \$5.98 billion if the predictor variables are kept constant.

TABLE 1: Annual Spending by Lobbyists,	Costs of Hacking,	and Operating Expense	es for U.S.
Banking & E-Commerce Sectors			

YEAR		HACKERS <sup>2</sup>	OPERATING EXPENSES
1999	\$35,717,141.00	\$10,000	\$515,280,882,000.00
2000	\$94,410,642.00	\$265	\$595,699,451,000.00
2001	\$39,507,903.00	\$378	\$576,905,570,000.00
2002	\$80,522, 72.00	\$456	\$520,443,892,000.00
2003	\$50,019,601.00	\$55,000	\$499,136,684,000.00
2004	\$105,807,024.00	\$52,600	\$507,332,148,000.00
2005	\$60,703,321.00	\$867	\$618,257,619,000.00
2006	\$106,493,108.00	\$100,870	\$744,964,897,000.00
2007	\$86,890,170.00	\$120,410	\$956,764,549,000.00
2008	\$157,434,205.00	\$237,400	\$798,493,334,000.00
2009	\$94,425,852.00	\$150,660	\$807,274,512,000.00
2010	\$142,986,936.00	\$164,420	\$717,391,065,000.00

The value represents the lobbyists' annual contribution to the financial and retail sectors.

The value represents costs of hacking and protection by mainly financial and e-commerce sectors.

The value represents the annual operating expenses for the U.S. banking and e-commerce sectors.

TABLE 2: U.S. Banking & E-Commerce Operating Expenses versus Lobbyists, Ha	lackers, 1	999-2010
Regression Analysis		

PREDICTOR	COEF	SE COEFF	Т	Р
Constant	5.977333E+11	97114793111	6.15	0.000
Lobbyist	-0.731	1.446	-0.51	0.625
Hackers (in millions)	1630.7	688.6	2.37	0.042
0 440404504 D.0 54				

S = 110491521; R-Sq = 54.5%; R-Sq (adj) = 44.4%

OPERATING EXPENSES = 5.98E+11 - 731 Lobbyists + 1630653 Hackers

**TABLE 3:** U.S. Banking & E-Commerce Operating Expenses versus Lobbyists, Hackers, 1999-2010

 Analysis of Variance

	-				
SOURCE	DF	SS	MS	F	Р
Regression	2	1.31642E+23	6.58208E+22	5.39	0.029
Residual Error	9	1.09875E+23	1.22084E+22		
Total	11	2.41517E+23			
SOURCE	DF	Seq SS			
Lobbyists	1	1.28517E+23			
Hackers (in mln.)	1	3.12432E+21			

**TABLE 4:** U.S. Banking & E-Commerce Operating Expenses versus Lobbyists, Hackers, 1999-2010

 Unusual Observation

Obs	Hackers	<b>Operating Expenses</b>	; Fit	SE Fit	Residual	St. Resid		
9	120410	9.56765E.11	7.30529E.11	45779484067	2.26235E.11	2.25R <sup>1</sup>		
<sup>1</sup> R denotes an observation with a large standardized residual								

'R denotes an observation with a large standardized residual.

The coefficient of determinant R2 can be used to predict how accurate and fit the derived regression equation is for the data. The value of 54.5% indicates that 54.5 percent of the changes in Operating

Expenses are explainable by the- independent predictors- Lobbyists' spending and Hackers' cost. This means that about 45.5% of the volatility of the Operating Expenses cannot be explained by the predictor variables. The adjusted R2 measures how well the regression equation fits the data, because the R2 tends to over estimate the strength of the association. The value of the adjusted R2 is 44.4% as against the 54.5% for R2. The p-value for the predictor variable Hackers is 0.42 indicating that the variation in Operating Expenses is significant at the 5% level. Thus the null hypothesis that the Hackers have no effect of Operating Expenses is rejected. The P-value for the predictor variable Lobbyists is 0.625 indicating that there is weak evidence, for the alternative hypothesis, that the predictor contributes to the variation in Operating Expenses during the period.

The weak effect of Lobbyists' spending on Operating Expenses recorded in this test can be misleading, because the activities of lobbyist have significant effect. A recent study (Alexander et al., 2009) estimates that U.S. firms lobbying for a tax holiday have a return in excess of two hundred and twenty dollars (\$220) for every dollar spent on lobbying. In Table 3, the Analysis of Variance, the F-statistic is compared with 2 and 9 degrees of freedoms and has a value of 5.39. As a result, the value of P-value is 0.029 indicating that there is evidence to suggest that at least one of the predictors is non-zero; as shown in Table 2, above, the significant predictor of the two is Hackers. In Table 4, the Unusual Observations in the dataset has a value of 9 which indicates a high leverage (influence on the regression estimates) and a large standardized residual2.

#### **CONCLUDING REMARKS**

The above study showed that the existing theories of market failure in the literature hinge on the premise that only market participants can cause market failure. This means that unless individuals, businesses, and governments are directly engaged in a market transaction they cannot cause a market failure. The study showed that nonmarket participants can cause a market failure too, because, by definition, a market failure can occur if there is any deviation from the assumptions of the perfectly competitive equilibrium. The concept of market internality, instead of the generic term of market failure, which capture more appropriately the way nonmarket participants affect a market, was used in the discussion proper; two types of market internality are a negative and positive internality representing a market failure occurring when nonmarket participants impose extra costs or benefit on a market, respectively. To show how nonmarket participants cause a negative internality, the study employed the multiple regression analysis to estimate the effects of lobbying and Internet hacking on the U.S. banking and e-commerce sectors, between1999-2010.

In sum, further research on this topic area should be encouraged for there is a vital link between a good understanding of the topic of market failure and effective management of the market economy. This means that the knowledge of market failure can help improve the effective management of the economy. It is in this regard that this study may turn out to be potentially beneficial.

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#### **ENDNOTES**

1. Unlike the term of market externality which conveys the idea that activities going on in a market can impose extra costs or benefits on a bystander, the concept of market internality conveys the idea that activities occurring outside a market can impose extra costs or benefits on a market.

2. The author can provide the histogram, graphs, and separate tests run on individual predictor variable.

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# Teaching Principles of Economics of Sport through Online Instruction

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#### ABSTRACT

This paper aims to explore the need for and specific characteristics of teaching economics of sport via the internet. Academic indicators of student performance taking a sports economics on-line class will be also examined. Finally, the study will strive to answer the question what are the factors influencing student performance in an online economics of sports class and what can educators, who teach online and face-to-face economics of sports classes learn from the data provided.

# INTRODUCTION

Sports management is a relatively new field of study. In 1980 there were fewer than 20 undergraduate sport management programs in the United States while today the North American Society for Sport Management (NASSM) website lists 360 undergraduate programs. (www.nassm.org) It is fair to say that sports management is exploding as an academic discipline at both undergraduate and graduate level. St John's University (Queens, New York) introduced its sport management undergraduate program approximately 36 years ago. Since then the program has grown into a Sport Management Division in its own right as part of the University's College of Professional Studies currently with 454 undergraduate majors. St John's also started to offer a graduate degree in Sport Management in September 2007. Recently, it has 66 enrolled graduate students (Voute MacDonald, 2012). As the program has evolved and grown through the years so did the demand for implementing classes via the internet. Recently, all of the required courses can be completed either online or in classroom. This paper seeks to determine how sport management majors' performance is affected when they take sports economics classes via the internet rather than in a traditional classroom setting. First, the paper summarizes the specifics of teaching economics of sport for sport management majors. Based on the data collected through several years of teaching in both setting, the study strives to show whether there is evidence for a better student performance in traditional or in on-line classes. Finally, the study answers the question of what are the factors influencing student performance in an online economics of sports class and what can educators, who teach online and face-to-face economics of sports classes learn from the data provided.

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When compared to more traditional fields of study, the economics of sport is a relatively new field of inquiry. The North American Society for Sport Management (NASSM) was formed and in the late 1980s. NASSM together with the National Association for Sport and Physical Education (NASPE) began the process of accreditation of sports management programs: they created the Sports Management Program Review Council (SMPRC) that published its accreditation standards in 1993. SPMRC established requirements for faculty, curriculum, course content, etc. Certain areas related to economic and financial underpinnings of the sport industry were included in the list, thus, sports management programs started to require students to take a course in sports economics, sport finance, or a combination of the two (Gerstner, 2007). Here it needs to be mentioned that at St John's University Economics of Sport is an upper level course for sport management majors and it has a prerequisite namely, ECONOMICS I that taught by a faculty of the Economics and Business Administration Division of the College of Professional Studies. Thus, students coming to Sports Economics class expected to know and understand the basic economic concepts. When St. John's University began to offer the course online in 2010 faculty had to reevaluate how best to deliver the material asynchronously.

#### TEACHING ECONOMICS OF SPORT VIA THE INTERNET

Urtel (2008) clarifies the difficulty of assessing the concept of 'distance learning' by stating: "[Difficulty]....is especially true given the vast increase and technological developments in (a) the definition of distance education (b) the formats of instruction and interaction (c) the entities who deliver it and (d) the demographics of [those] who receive it." A growing number of studies examine the differences in learning outcomes of traditional and on-line classes. Anstine and Skidmore (2005) find that on-line courses are less effective than face-to-face courses. At the same time, Harmon and Lambrinos (2008) focus our attention to the existing differences in human capital skills between on-line and traditional learners. Glanz's study (2013, forthcoming) points out the existing inconsistency of research findings related to the importance and effectiveness of distance learning in higher education, while Vogel's (2011) work analyzes the specific characteristics of teaching economics of sport through online, face-to-face, and hybrid methods of delivery.

St John's University – where we teach - began to offer courses through distance learning in 2000. Looking at the 2012 spring enrollment, approximately 15% of St John's students take at least one class online (www.stjohns.edu/admission). Economics of Sport has been offered in the traditional face-to-face classroom for sports management majors since 1999 at St John's as part of their required courses. Since 2010 students were able to choose between online and traditional setting education while selecting an Economics of Sports class. An online class has been offered during the summer as well as in the Fall or Spring semesters. The class size is maximized at 35 students in traditional and 20 in online classes. Although 56% of students are female at St John's University, the ratio of female students in the Sports Management major is around 10-15% while the number of female students in an Economics of Sports class is approximately two or three, or 8-10%. (Table 1.)

Tailoring an economics class to the interest and need of sports management majors has always been a challenging task. As it shown in Table 2, in Economics of Sports online classes at St John's University the professor teaching the class used the textbook (Fort, R: The Economics of Sport, 3rd edition), the shown DVDs and videos, the offering of consultation through office hours, and some of the weights in grading, specifically research projects and class participation thorough the semester the same way in both settings. The PowerPoint slideshows used and discussed in the face-to-face course is also very similar to the online classes. Another similarity in my Economics of Sport classes - whether it is in an online or face-to-face format - all of the lecture slides in the PowerPoint format ARE posted for the students BEFORE the class starts. In the case of the face-to-face classes the slideshows are posted online. In the online class at St John's we use the Blackboard system, thus all of the slideshows are posted for each lecture at the beginning of the semester for the whole course content. It is safe to say that the course material and structure of the traditional face-to-face course is very similar to the online course with the course split into twelve distinct topics with approximately one week for each topic area. At the same time, there are existing structural differences in teaching methods between the face-to face and online settings. Namely, in face-to-face class students get homework occasionally at the discretion of the professor, while in online Economics of Sport classes homework assignments are assigned on a weekly basis and their weight in the overall grade is high, approximately 30-40% of students' final grades versus the face-to-face classes where the weight is around 10-15%. The weight of the research project is always the same 30%, although depending on the professor's preference or, in online classes, on the size of the class it can be a group or an individual project. The mentioned 'tailoring' of the content from an economics into a sports economics class while taking into consideration the sports management students' needs in each and every class also presents an additional difficulty when teaching through the Internet. In this case, the course material usually is posted at the beginning of the semester by the professor, ensuring a clear shell for asynchronous communication between the students and the professor during the forthcoming weeks. Namely, the slideshows for each week's lecture, the assigned DVDs or videos to watch and the related questions to their content, the overall evaluation and assessment criteria for each and every assignment as well as for the general performance in the class should be and would be posted to the course website on Blackboard at the beginning of the semester. That means the students can see the general format of the class and understand the requirements as well as the deadline for postings in the respective online class. In the online setting, the professor teaching the class starts to see the students' needs just after the class has already started and the first postings have already been completed by the students. Finally, a major difference exists between online and face-to-face classes related to testing. At St John's University in Economics of Sports courses delivered through the internet students do not have structured exams, while in face to face classes students must complete a proctored exam.

Table 1: Enrollment in Sports Management Program at St John's University (NY, L	JSA)
---	------

Campus	QUEE	INS		STATEN ISLAND			Grand total	Grand total	
	Male	female	total	male	female	total		male	female
2009 spring	285	49	334	59	49	108	442	344	98
2009 fall	333	50	383	37	3	40	423	370	53
2010 spring	332	47	379	38	2	40	419	370	49
2010 fall	367	46	413	37	5	42	455	404	51
2011 spring	343	46	389	35	6	41	430	378	52
2011 fall	372	56	428	30	2	32	460	402	58
2012 spring	370	61	431	33	2	35	466	403	63

# Table 2: Structural Difference - Face-to-face and Online Classes in Economics of Sports

Traditional format	Online learners
Standard textbook	Standard textbook (same as for the traditional class)
No homework, more focus on class participation and assessment	Online quiz for each chapter in a form of a homework
3 hours of lecture a week (Monday-Thursday schedule)	Electronic bulletin board (blackboard) for asynchronous communication (weekly homework + discussion)
Individual research project related to topics	Group project (depending on class size) using assigned chat-rooms for group works
Videos, dvds, movies are assigned or shown in the classroom occasionally	Assigned videos, movies occasionally
Email to professor and opportunity to asking	Email to professor or asking peers (professor)
question after each class in person	through discussion board
Office hours on campus	Office hours by appointment
Class participation is crucial and part of the grade	Class participation is part of the grade (evaluation
	based on postings)

# STUDENTS' PERFORMANCE

While the aforementioned problems underlie and motivate the analysis for this paper, they describe pedagogical issues that do not have definitive solutions. Using a grade production function, where the final grade earned for the Economics of Sport course represents a measure of the student's performance during the semester, we focus on the question of whether the learning environment impacted students' performance across the two teaching formats. The analysis is conducted across three online and three traditional courses taught by the same faculty in the 2010, 2011, and 2012 academic years respectively. There are a total of 98 observations from six courses - 34 students have taken the course online while 64 through the traditional classroom format. Specific student attributes such as student GPA, major, gender, and grades in other Economics course that must be taken as a prerequisite before entering the Economics of Sports class are available through St John's Central, a course management system used and utilized by the University. All names have been stripped away from the data so there is no way to trace a particular grade back to the individual student.

The hypothesis we are about to test is that the final grade of students in online sections will not be different than the final grades of those in traditional classroom sections. Students' T-test was used for

testing a hypothesis on the basis of a difference between sample means, that is the T-test determines a probability that two populations are the same with respect to the variable tested.

The results of the T-test by using MINITAB are shown in Table 3.

Table 3.	Two-Sample	T-Test and C	CI: regular.	online

Two-sample T for traditional vs online courses							
	Ν	Mean	StDev	SE Mean			
Regular	64	3.202	0.902	0.11			
Online	34	3.01	1.17	0.20			

Difference = mu (regular) - mu (online)

Estimate for difference: 0.187

95% CI for difference: (-0.274, 0.647)

T-Test of difference = 0 (vs not =): T-Value = 0.81 P-Value = 0.420 DF = 54

Since the p value is greater than 0.05 (0.42), we accept the hypothesis that there is no statistical difference between the means of the course grades. The final grade for online students was lower than for traditional students. However, the results were not statistically significant and the 95% confidence interval of the coefficient would include zero. The average grade in the Economics of Sport class for the online students was 3.014 which correspond to a B. The average grade for students in the traditional sections was 3.2, which correspond to a low B+. Figure 1 shows grade distribution between traditional and online classes. The median for the regular class is 3.3 the mean is 3.203, while the same data for the online class are 3.7 and 3.014. As we see the data for the grade distribution for both the online and the regular class is skewed to the left, meaning, the median shifts to the left the second most, and the mode the least affected by the presence of skew in the data.

Looking at the data it is easy to see that the results for both teaching formats are very similar. Whether the course was offered face-to-face or online does appear to matter with students in the online format having an edge in overall grade performance. There may be some self-selection issues regarding students taking these courses online – but since the course is required for sports management majors and they do not know whether the course will be offered online or face-to-face in future semester, many students are likely to enroll in the course when it comes up and fits their planned graduation schedule. It also needs to be noted, that through the existing asynchronous teaching method students in the online classes had greater ability to consult a whole range of course materials while completing course assignments as opposed to students in traditional classroom setting.





Another explanation for the slightly higher grades in online class can be seen in the higher individual responsibility of students for their own learning outcomes in any online course setting. Also, the fact that students in traditional courses faced fully proctored closed book in-class exams may also have resulted in scores that were lower than in the online format.

The two other variables needed to be examined with respect of our students' performance in the two course formats were the following. First, whether the students' GPA before enrolling into the Economics of Sports class will show statistically significant impact on students' performance; and second, whether taking Economics 1001 as prerequisite to Economics of Sport will positively impact students' performance in the class – taken by the students online or face-to-face. In relation to students' GPA before enrolling into sports economics class the data shows that the average GPA for the online students was 3.2, while the average GPA for the traditional sections was 3.01. This supports the statement that the students in the online classes were more responsible, mature than those in the traditional classes. At St John's University the official prerequisite for Economics of Sport course is the Economics 1001, which is a macroeconomics course. The correlation for the grades earned in macroeconomics and Economics of

sports courses for the whole cohort is extremely weak (0.06). The reason for this is that students are enrolled in the macroeconomics course usually in their freshman year, while the economics of Sport is an upper-level course.

As has been noted by all study comparing outcomes between traditional and online formats, the online courses require a certain level of commitment and self-motivation on the part of a student to complete the class successfully. Our data showed that students enrolling in online Economics of Sports class have a slightly higher GPA and vet a slightly lower performance than students in traditional classroom settings. The data shows the positive affect of taking Microeconomics on students' performance in the Economics of Sports class. At the same time, our analysis also showed that there is no statistically significant difference between students' performance between online and face to face courses.

Table 4: Grade Points of Students in Economics I and Economics of Sports Classes										
Grade points	1	1.3	1.7	2	2.3	2.7	3	3.3	3.7	4
Number of students earning this grade in Economic I	2	2	4	6	6	7	8	5	10	16
Number of students in Economics of Sports earning the	2	2	4	6	6	3	7	2	6	6
same or a higher grade										
Number of students in Economics of Sports earning a						4	1	3	4	10
lower grade										

# **CONCLUSION AND FUTURE RESEARCH**

Online course instructions have become a mainstay on the college campuses all around the country. The main issue facing faculty, administration, accrediting bodies, as well as of course our students regarding this new teaching model is: is it as effective as teaching in the traditional classroom? With scholarly research growing on effectiveness of online versus traditional model of teaching the results of this research is becoming more and more inconclusive. The results of our analysis suggest that there are some differences in outcomes between the two teaching formats. But the existing difference is far for being statistically significant. As an ever larger pool of universities are offering online – as well as hybrid – courses growing number of faculty are starting to teach online or at least, supplement their face-to-face classes with some sort of online content material. Thus, the difference between the two teaching methods has begun to narrow. There will be a continuing need to evaluate how to better leverage the usage of technology as well as each of these instructional formats. The question we must ask ourselves is not necessarily which mode or format of teaching is better, but most importantly how we, the instructors can use each and every mode or format more effectively for the benefit of our students. This is the line of research we need to pursue in the future.

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# The Essence of Biophysical Economics

# Kent A. Klitgaard<sup>\*</sup>

#### ABSTRACT

As the world enters the "second half of the age of oil, characterized by declining energy quality and quantity and rising prices, a new economics is needed to explain this unprecedented phenomena. Biophysical economics is the beginning of just such a theory. This essay delineates a set of theoretical principles, compares and contrasts biophysical economics with both mainstream and ecological economics, and grounds the theory in both energy studies and the insights of heterodox political economy.

#### INTRODUCTION

We are about to enter the second half of the age of oil. This era will commence when oil production peaks, or when humans have extracted half the oil that was once in the ground. The second half of the age of oil will also be the end of cheap oil, as the supply of cheaply extracted and refined oil will be in decline while global demand continues to increase, driven primarily by large emerging economies such as China and India. In October of 2009 the International Society for Biophysical Economics was formed, in an attempt to better understand the dynamics of the post-peak era. The meeting was chronicled in the New York Times as a new approach to economics (Gronewald 2009). Biophysical economics did not materialize from a vacuum. Rather it was the culmination of many years of research on the role energy plays in economic development, the limits to economic growth, and the insights of political economy (Cleveland, et al. 1983, Hall, et al. 1986, Hall and Klitgaard 2006, Gowdy, et al 2010a, 2010b, Hall and Klitgaard 2011). Biophysical economics shares a great deal with ecological economics, although some major differences exist, but shares relative little with the variants of mainstream economics. The basic elements of biophysical economics include:

A focus on stocks and flows of matter and energy, rather than upon individual behavior. A great emphasis is placed on energy quality as well as the quantity of energy available.

The study of economics should be approached as a physical science as well as a social science. Therefore its analyses must be consistent with the known laws of science and the knowledge of other scientific disciplines; economies and societies are complex systems that interact with natural systems and are characterized by the properties of natural systems: inputs and outputs; boundaries; interactions; and the existence of positive as well as negative feedbacks.

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Economics should be placed in a historical context, and focus upon explaining the evolution of social structures and institutions;

The economy should be studied as an actual social system, one that it concentrated, globalized and financialized not as an abstract system of perfect competition.

The belief that heterodox political economy is a more fruitful approach to integrate nature into the human economy than is mainstream neoclassical economics.

#### **BIOPHYSICAL ECONOMICS AND ECOLOGICAL ECONOMICS**

Biophysical economics shares some major principles with ecological economics. The most important is that the economy is a subsystem embedded in the finite and non-growing primary system of planet Earth. As a sub-system the economy is subject to the limits of the primary system and must obey the fundamental laws of science, especially the laws of thermodynamics and the conservation of matter and energy. With this, we agree, although we believe that ecological economics has not pursued the idea of the internal limits to growth or the effects upon working people of pursuing low-cost production across the globe. Ecological economics has pursued two separate directions: natural capital and the steady-state economy (SSE), and both flow from the insights of Herman Daly, whose importance we recognize, even in criticism.

The natural capital approach is the most neo-classically oriented, and the most problematic. The premise is that the stocks of nature are capital, which is only turned into resources when they are removed from nature and placed within the flows of the economy. For example, lumber is a resource and a forest is a capital asset. Unfortunately the National Income and Product Accounts treat the depletion of natural capital as current income and do not depreciate stocks of nature. Rather they treat their depletion as current income. If stocks of nature were valued properly as capital assets, the market system could then allocate them efficiently. While biophysical economists commend the valuing of natural assets, we do not make the next step that they will be allocated efficiently once their price is known. There are broader considerations in the stagnating macroeconomy that keeps this from occurring. I will develop this critique in the final section.

The steady-state approach of ecological economics is closer to the premises of biophysical economics, in that the limits to growth are already upon us. They are not just problems of the future. Since we have already exceeded nature's limits in many cases, the economy must actually shrink in order to step back from current overshoot. Most advocates of the steady-state contend this may be accomplished within the confines of the current institutional structure of the market economy. But this entails a theoretical separation of market forces that act in concert in the actual economy. Analytically Daly separates allocation from distribution and optimal macroeconomic scale. In his assessment, markets are simply devices for allocation and they do this efficiently (Daly 1996). Distribution, however, must be judged on the principle of justice and macroeconomic scale upon sustainability, not upon allocative efficiency. A sustainable scale and just distribution must also be the products of economic planning.

Biophysical economics contends that this is not the case. Allocation and distribution are connected intimately, and the neoclassical theory of income distribution (marginal productivity) is based on the same mathematical and theoretical structure as is allocation. Perfectly competitive equilibria produce both allocative efficiency and equity. They are difficult to separate, as market outcomes in the real world can and do produce profound degrees of inequality. Such disparities, grounded in the labor process and the international division of labor, cannot simply be fixed easily by means of economic policy. They are deeply embedded in the mechanism of allocation. Growth, or more precisely capital accumulation, is the very essence of the present capitalist economy. Moreover, economic growth has been the vehicle for the expansion of employment and the reduction of poverty. It would be difficult to reduce the scale of output without major consequences for employment, and consequently, for a more skewed income distribution. In short, it is hard to imagine theoretically a non-growing capitalism. Biophysical economics is based on the idea that economic growth rates are already slowing in the wealthy industrial nations, and that the onset of nature's strict biophysical limits will limit economic growth and capital accumulation to an even greater degree. Biophysical economics is an economics for the era of degrowth. In fact, the United States' economy has already begun to experience slower rates of economic growth since the 1960s, and especially since the peak of domestic oil production in 1970, despite pro-growth agendas of liberal and conservative administrations alike.

Decade	Annual Growth Rate
1960s	4.4%
1970s	3.3%
1980s	3.0%
1990s	3.2%
2000s	1.7%
1960s 1970s 1980s 1990s 2000s	4.4% 3.3% 3.0% 3.2% 1.7%

Source: U.S. Department of Commerce Bureau of Economic Analysis

Despite the current rhetoric that unleashing entrepreneurs will restore vibrant growth, the Commerce Department data show that the years of the most conservative administrations (Reagan, Bush I & II) produced the slowest growth rates of the post-World War II era. But growth is not just a matter of economic policy. Growth rates in the first two years of the 2010s remain mired at an average of 2.1 percent despite an expansive fiscal stimulus, shrinking taxes, and persistent easy money policy. Biophysical economists contend that the shrinking of growth rates are connected deeply to the rising cost and declining quality of energy. Postwar economic growth was built upon political hegemony and cheap petroleum. As both begin to fade there is little likelihood that marginal adjustments in taxing and spending can restore the biophysical basis of economic growth in the post-peak era.

Biophysical economics begins with the study of flows of matter and energy, rather than with individual maximizing behavior. It does not begin with the individual as a "hedonistic globule of self aggrandizement" (Veblen 1898), or end with the universal declaration of efficiency and equity to be found by means of free market equilibrium. Instead of adopting the idea that an economy can be analyzed adequately by looking

solely at the exchange mechanism (an approach that began with Bastiat and permeates neoclassical thought) the principles of biophysical economics begins with the relation between humans and nature. The biophysical approach defines economics substantively in the tradition of Karl Polanyi.

The substantive meaning of economics derives from man's dependence for his living upon nature and his fellows. It refers to the interchange with his natural and social environment, insofar as this results in supplying him with the means of material want satisfaction (Polanyi 1957.)

#### A CRITIQUE OF NEOCLASSICAL ECONOMICS

Biophysical economics begins with the study of stocks and flows of matter and energy, which puts it in direct opposition to mainstream economics. Neoclassical economics starts with rational, acquisitive, and self-interested individuals and the ends with the formation of equilibrium prices that create efficient and equitable market outcomes. Unfortunately the set of assumptions needed to produce these outcomes are neither consistent with the current research in behavioral science, nor do they conform to the laws of thermodynamics. The assumptions are driven primarily by the calculus of constrained optimization and include provisions such as all economic agents operate independently from one another, all market goods and productive inputs have close substitutes, and that prices are capable of carrying all the information needed for consumers and producers to make rational decisions that lead to optimal and efficient allocations (Gowdy, et al. 2010).

Neoclassical economics is defined by the idea of scarcity. "Economics is the study of the allocation of scarce resources among alternative uses." However, all scarcity in the neoclassical sense is relative scarcity. The behavioral assumptions about acquisitiveness, in conjunction with the mathematical functions, yield human beings with unlimited wants. No matter how abundant resources or market goods may be, they are always scarce relative to unlimited wants. Absolute scarcity, or an insufficient quantity of a good or resource, is not problematic as neoclassical economics assumes all resources and products have substitutes. Even though these substitutes are not immediately present, they can be found by either technological change or trade. One must question how we can ever achieve sustainability if people behave as neoclassical postulates assert they do, and when the ecological footprint of the Earth is already 1.5 times the aggregate biocapacity. In essence neoclassical economics begins with the position that one needs to study only the processes of exchange and price formation in order to capture fully the nature of an economy. Moreover the economy is the primary system, not a subsystem. No larger system, such as the planet, can constrain the economy. Rational individuals respond to price incentives, and prices carry all the useful information needed to make rational and self-interested decisions. Moreover, positive feedback loops are either absent or dominated by negative feedback loops Prices alone regulate the market. A single price exists that satisfies both buyers and sellers. Once an equilibrium price is achieved any perturbation will enable the negative feedbacks to restore equilibrium. The market equilibrium will also exhibit allocative efficiency. Prices will equal the marginal cost of bringing another unit of output to the market. This solution, however, will exist only under the condition of perfect competition where businesses are willing to accept no economic profit. This efficiency can only exist in the case where an enormous number of equally powerless firms, with neither technological advantage, priority command over resources, nor innovative products or processes. Equity, or fairness, occurs when every "factor of production" (workers, landowners, entrepreneurs) receives exactly their contribution to output, no more and no less. Where the funds for technological innovation will come from is not addressed directly in the theory of pure exchange.

Furthermore, there are no differences between individual markets, say for and the market economy as a whole. Since firms are numerous, small and powerless no one single entity can influence the all-important market price. The macroeconomy is simply an aggregation of myriad small firms that behaves the same as do the individual entities. In other words neoclassical economics does not recognize the existence of complex positive feedbacks in the overall system. The economy as a whole can be depicted as a simple "circular flow." In the end the value of the output in money terms equals the sum of the factor payments. The system remains in stable balance. Power remains diffuse and periods of depression are theoretically impossible. This conception is inconsistent with the laws of thermodynamics. For the economy to balance there can be no waste in terms of production or distribution. But every productive process that involves energy produces waste in the form of scrap and heat. This cannot be accounted for in the neoclassical conception of the circular flow.

Finally, neoclassical economics sees itself as universal science—able to explain any situation in any spatial location at any time in history. Human behavior comes from "human nature," and the postulates concerning this behavior are accepted without empirical testing as "maintained hypotheses." Any discussion of the importance of institutional structure is dismissed save the study of economic history, where the process of becoming as mass consumption society is chronicled and celebrated (Rostow 1960, DeVroey 1975).

However the real world is vastly different than are the abstractions of neoclassical economics. Real individuals are simply not like the rational maximizers of satisfaction posited by neoclassical economics. Households are more than units of consumption. They are also refuges from the hectic day-to-day world. They are where the next generation is reproduced and nurtured. When the neoclassical postulates of rational, self interest are subjected to empirical testing evidence does not confirm the postulates. Humans are as likely to be vindictive or altruistic as they are rational. Moreover humans exist in society. There is no consistent evidence that preferences are self-regarding, and independent of any other preference structure (Gowdy, et al. 2010). In addition business firms are not "perfectly competitive" as is required for the achievement of an allocatively efficient and equitable equilibrium. Real world firms have advantages of location and power. While firms may have once been small, their evolution and development after the age of fossil fuels resulted in large concentrated industries that possess sufficient power as not to have to accept zero profits. Giant multinational corporations, operating in the world's megacities, are not organized in the same manner as are small town family businesses. Biophysical economics focuses explicitly on power relations in both the physical sense of energy per unit of time, and in the social sense

of control over others. The changing nature of energy and control over markets and processes tells much about the character of a society that simply cannot be inferred from price.

# THE CRUCIAL ROLE OF ENERGY

Biophysical economics makes no claim that economics is a universal science whose principles are embedded deeply in "human nature" and therefore should not be subject to change. Rather, by focusing on how the human economy is shaped by its use of energy, biophysical economics looks at social evolution. Biophysical economics has more interest in the explanation of changes in institutional structure over the course of time than in price formation. Rather, it focuses upon questions of energy quality. Economic limits will likely result from the decline in the quantity, and increase in price, of available energy. The challenge is not simply technological, but economic. Great fortunes can be gained or lost in the transition of energy regimes, and the short-term horizons embedded in market processes have yet to embrace alternative technologies or conservation as long as fossil fuels remain cheap. But soon global oil production will peak just as domestic production in the continental United States peaked in 1970. While some energy needs, especially the generation of electricity, can be, and are being, met by abundant natural gas, not all can be. Natural gas does not power many vehicles as the expensive supportive infrastructure is not yet built. Moreover the techniques used to extract the natural gas, such as hydraulic fracturing and horizontal drilling, leave behind myriad potential problems such as the reduction of water quality, the overwhelming of local sewage treatment systems, and the impact of moving heavy equipment to the drilling sites on the integrity of local roads and upon local air quality. Finally, while natural gas emits far less carbon dioxide per unit of heat than does coal, one cannot reduce the concentration of carbon dioxide in the atmosphere from an estimated 390 parts per million to the needed 350 ppm by increasing carbon emissions at a decreasing rate. We must cut fossil fuel use, not just change its composition.

# DIMINISHING MARGINAL RETURNS AND THE ENERGY RETURN ON INVESTMENT

The debate on energy quality goes back to Ricardo and his principles of diminishing marginal returns. Just like the English aristocracy and gentry put the most fertile land into production first while leaving the least fertile lands for later, humans have exploited the most accessible and best quality hydrocarbons first. The Earth's crust has been subjected to computer modeling and seismic testing. The result has been few new discoveries, and those that show any promise are smaller in size, and subject to either hostile climates, hostile politics, deepwater, incompletely reduced bitumen (as in the Athabasca Tar Sands), or low quality "heavy sour" crude. It will become more expensive in terms of energy, as well as in terms of dollars, to extract and refine the remaining hydrocarbons. Energy prices, just like food prices for Ricardo, will tend to rise, and the impact upon society will be profound.

The Energy Return on Investment (EROI) is the principle measure of energy quality. It is a measure of the energy returned to society divided by energy put into a particular activity. It turns out to be a pure number, as the units of energy are the same for numerator and denominator. Costs of oil production and

exploration were low in the early days of domestic oil production. More sophisticated, and more expensive, technologies will be needed to tap deep water and Arctic sources. The EROI was estimated at 100:1 when large discoveries of oil in Texas and Oklahoma made the 1930s the decade of peak discoveries. After domestic oil production peaked in the 1970s the costs of production increased and the EROI fell to about 40:1. By 2000 the EROI for domestic oil was only 14:1 (Hall and Klitgaard 2011). A great deal of work is being done currently on refining the EROI concept. The figures given were for the wellhead. But should the costs of refining and transporting the fuel also be included? Should the costs of transforming the oil into fertilizer, growing food, and feeding the families of the oil workers be included? These are important questions. What level of EROI will we need in order to support health care and education systems? Hall and colleagues estimate that an EROI of at least 5:1 will be needed to support a sustainable civil society (Hall, et al. 2009). As the energy surplus declines with falling EROI, the economic surplus upon which modern society is built, may be destined to follow.

# ECONOMIC SURPLUS AND HETERODOX POLITICAL ECONOMY

Rather than taking relative scarcity as its starting point, biophysical economics stresses economic surplus and absolute scarcity. An economic surplus is the difference between the value of a society's output and the cost of producing it (Baran and Sweezy 1966), and a surplus approach is clearly implied by the substantive definition of economics. Biophysical economics also accepts the point that absolute scarcity is not transcended easily by trade or technology. Even if substitutes can be found or new technologies developed, the transitions are often difficult and full of conflict. In the biophysical sense technology is not a "black box" process in which output is magically increased without any addition to inputs. Technological change is dependent upon energy! Most of the great epoch-making innovations of the 19th and 20th centuries such as the steam engine, the railroads, the automobile, electrification required an increase in net energy in order to transform the economy. Without an energy surplus there would be little economic surplus. It is this energy surplus that allows expanding population to concentrate in cities, achieve higher standards of living, and to provide health care, education, and innovations. Energy is not simply another input into production.

The substantive definition also implies that economic theory needs to be grounded in production, in the process of how human beings use energy to transform the products of nature into useful products that satisfy human need. Prices themselves are determined largely by the cost of the cost of production, including energy costs. Biophysical economics puts the analytical focus upon production while neoclassical economics treats it peripherally, by the same method (constrained optimization) used to calculate how goods satisfy human psychological preferences. Combining a focus on the institutions of production and a historical perspective creates an analytical need to trace the evolution of market economies, not just take them for granted. This is important because over the long course of human history, market economies have occupied a small niche in time and space. The historical time frame of the dominance of market economies occurs mostly, although not exclusively, in the time of fossil fuels as

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a source of energy and power. For the vast major of its existence the human population can be characterized by three phenomena. 1) a small energy surplus obtained from the solar flow; 2) craft production for direct use; and 3) a low and stable population.

Solar energy is essentially unlimited and non-polluting. Unfortunately it is diffuse, hard to capture and hard to store. For eons before the evolution of humans, plants served this purpose. Humans at first simply appropriated the energy surplus as they found it (hunters and gatherers) and later, with the development of agriculture, transformed the capture of solar energy to provide more food. However, as stated by anthropologist Joseph Tainter, solar energy was local and current, which limited the economic surplus. Such early societies tended to produce for direct use, rather than producing large quantities of products to be sold on markets. Certainly trade has existed since antiquity, but early societies produced use values and traded their surpluses. Production for exchange, or production of commodities, would not appear until the 16th century. By finding innovative ways to use solar energy, such as harnessing wind and water, early societies could increase the energy surplus and therefore the economic surplus. It was this surplus that allowed the cities of the ancient world to thrive. When the energy surplus disappeared many complex ancient cities simply collapsed (Tainter 1990). The modern world, on the other hand, is characterized by: 1) a large energy surplus obtained from fossil fuels; 2) mass production for profit and for market exchange; and 3) a large and rapidly growing population. Around the beginning of the 18th Europeans, having depleted most of the wood upon which their societies were built turned to coal as a rather inferior substitute. However they soon found that coal could be turned into a hotter burning fuel called coke by the same process by which wood is turned into charcoal. The industrial revolution was based, biophysically, upon this new fossil hydrocarbon. Fossil hydrocarbons were ancient and global. They were relatively cheap, highly energy dense, and easy to capture and easy to store and transport. However the industrial revolution was more than increased use of hydrocarbons and machines. It also entailed social transformations in the scale upon which work was organized, the degree of skill and control working people were able to exert, and the very conception of what wealth was. It was during this time frame that economics evolved as a separate discipline.

In the earliest era the study was known as classical political economy. It was grounded in the questions of how was wealth created and distributed, and to how did an economy grow? To pursue these questions classical political economists looked primarily at the process of production. How were the products of nature transformed into useable commodities that could be sold on markets by means of machinery and human labor? Furthermore, their primary unit of analysis was that of social class, and the abstract analytical categories of land, labor and capital had their material bases in social classes of a landed aristocracy, wage-workers, and those who employed money to produce goods and services by means of hired wage labor. The overall grounding ambition was to discover any underlying laws of the accumulation of wealth (DeVroey 1975, Hall and Klitgaard 2011).

All theories of classical political economy contained the position that capital accumulation and economic growth were self-limiting. Eventually the growing, "progressive" state would succumb to a long

stagnation known as the stationary state, a situation that Adam Smith termed "melancholy." Different classical political economists enunciated different reasons for the stationary state. Smith believed that it was due to the evaporation of new and lucrative investments as the economy matured. Thomas Malthus believed the growth in human population and the transfer of wealth from the aristocracy to an emerging class of capitalists lie at the heart of the problem. David Ricardo saw the problem in diminishing returns. Of all the classical political economists only John Stuart Mill saw the stationary state as a social improvement. Only in the stationary state could the cutthroat competition of Victorian capitalism give way to a more refined and genteel pursuit of knowledge and beauty. Although Karl Marx did not subscribe to a stationary state theory, he believed that continued capital accumulation and economic growth were selflimiting. Once the economy becomes dominated by large-scale monopolies (which Marx predicted) and sophisticated fossil fuel driven machinery creates an ever-growing surplus, the inability to find an adequate number of spending outlets, coupled with a lack of price competition among monopolies, makes the long-term tendency towards stagnation re-emerge (Baran and Sweezy 1966, Hall and Klitgaard 2011). Traditional spending outlets (consumption, investment, civilian government spending) have been inadequate to fully absorb the economic surplus. This is the primary course of declining growth rates since the 1960s. If spending on productive uses is insufficient then waste in the form of planned obsolescence, and automobile-dependent suburban sprawl, can absorb the surplus partially. But in the end, the overall trajectory of history has been towards stagnation. One explanation of periods of prosperity is that is that stagnation has been postponed by a series of "epoch-making innovations" that both revolutionize production and create the ability to absorb the economic surplus (Baran and Sweezy 1966). Most, if not all, epoch-making innovations such as the steam engine, the railroad, electricity, and the automobile, have been fossil-fuel intensive. Whether growth can continue in the absence of fossil-fuel led innovation is a question for much further research and beyond the scope of this paper. Nevertheless, this means that the focus on economic surplus also gives political economy, as well as biophysical economics, a very different perspective on the difference between the economy-as-a-whole and the individual firm.

#### THE INSIGHTS OF POLITICAL ECONOMY

Biophysical economics returns to the insights of political economy: that the economy is best analyzed by starting at the point of production, that economic surpluses and absolute scarcities exist and are a superior analytical mechanism than is relative scarcity, and that conflicts over the production and distribution of the economic surplus are an important component of the story of economic evolution. Biophysical economics believes strongly that the human economy is subject to limits to growth. To the traditional subject matter of political economy, which focuses upon the internal limits to continued growth and capital accumulation, biophysical economics adds an analysis of external limits by focusing explicitly on energy. The limits may take the form of absolute scarcities, along with rising prices and decreasing quality, of fossil fuels, or the limits may be in the atmosphere's ability to absorb additional carbon from the
burning of these fuels. The two aspects of energy throughput will certainly interact, and they will impact the course of future growth, the reproduction of the economy, and most certainly the quality of life in urban areas. The looming biophysical limits, those posed by peak oil, declining EROI, and the potentially enormous cost of dealing with climate change are likely to occur in the same historical period, exacerbating an economy whose growth potential has been declining for decades. Biophysical economics, which recognizes the possibilities of a climate-compromised and energy short world, will be a better guideline to building such a sustainable society than the present individualistic, growth oriented forms of economic theory.

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# Deficit Spending and Economic Growth: A Feder Growth Model Approach

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The choice is whether to put hard limits on economic growth, or hard limits on the size of government, Paul Ryan, GOP Convention, August 2012.

I will always vote what I have promised, and always vote the Constitution, as well as I will not vote for one single penny that isn't paid for, because debt is the monster, debt is what's going to eat us up and that is why our economy is on the brink, Ron Paul, 2012.

Larger deficits are necessary and proper means to mitigate unemployment as the far greater evil in terms of human welfare, William Vickrey

#### ABSTRACT

Deficit spending has both its supporters and detractors. Supporters argue that such spending stimulates the economy in a typical Keynesian way. Detractors assert that economic growth is hampered by persistent government deficits largely because of a crowding out effect. The current paper utilizes a Feder Growth Model approach to analyze the impact of deficit spending on economic growth.

#### INTRODUCTION

We have heard a lot about deficits in the last three decades. Positions on the nature and consequences of deficits range from the Chartalists who believe that large structural deficits are necessary to the continued successful functioning of capitalism to the Austrian school which believes deficits fuel run-away inflation. Keynesians believe that deficits are necessary as counter-cyclical policy and Post-Keynesians believe that deficits are neutral in their impact. Deficits are also considered "detrimental" from the Neo-classical perspective because they supposedly crowd out the private sector and place an undue tax burden on future generations.

It is an empirical question as to whether deficits harm, help, or are neutral with respect to economic growth. That is, we can econometrically measure the impact of deficits on economic growth. The current work utilizes a Feder sources of growth model to test the hypothesis that fiscal deficits impact growth. The study demonstrates that, in the case of the United States, 1949-2011, annual government deficits seem to have a positive impact on growth.

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We begin the paper with a discussion of the extent and causes of the Fiscal deficit. We then move on to how deficits are treated in economic theory and the work then reports the Feder growth model results. Lastly, the paper concludes with a note on further research.

# THE EXTENT AND CAUSES OF THE US FISCAL DEFICIT

The magnitude of the US Fiscal deficit has indeed been growing over the past 35 years. Beginning in 1977 there is a marked and persistent increase in deficit spending with the rate of increase also accelerating, at least until 2009, at which time the rate of increase in deficit spending decreases.

Recent hyperbole in the press has indicated that the cause of rising deficits was the "run-away spending" by the Federal government with special blame being given to Presidents Bush and Obama. Figure 1 indicates the growth in Fiscal Outlays from 1977 through the projected 2013 fiscal years. As is evident from the chart there has been a persistent increase in outlays in all years but one (2010) and that the spending increase has seemingly been largely increasing at an increasing rate until the past few years where the rate of increase has slowed. The growth is projected to be nearly zero in 2013.



Source: Economic Report of the President, 2012.

Looking at only one side of the equation, outlays, can be quite misleading. As indicated in Figure 2, Fiscal Receipts also increased over the time period with some notable exceptions. Fiscal Receipts fell between 2001 and 2004; perhaps a result of the combination of recession and tax cuts. Fiscal Receipts also fell during the Great Recession, 2007-2009. It is not uncommon for receipts to fall during recessions. During the 1982 recession, receipts fell from 618.8 billion dollars to 600.6 billion. Even though, at the time, the 1982 recession was considered the worst recession since the Great Depression, this decline in receipts was notably much smaller than what occurred under the two subsequent recessions.

calls into doubt the idea that the decline in receipts is purely a result of recession and that other factors, namely tax cuts, must share in the blame.



Source: Economic Report of the President, 2012.

Figure 3 shows the impact of the combination of rising spending and declining receipts had on the Fiscal Deficit. The last surplus year was 2000. After that, the deficit worsens between 2000 and 2004, showing improvement from 2004 to 2007 and then plunging between 2007 and 2009. Between 2009 and 2010 there was a slight improvement and then a leveling off until 2012. Finally, the deficit is projected to improve rather significantly in 2013.



Source: Economic Report of the President, 2012.

As a percent of GDP, the deficit shows improvement between 2009 and 2011.



Source: Economic Report of the President, 2012.

These plots help us to understand better the cause of the current Fiscal Deficit. Blame cannot alone be borne by "run-away" government spending even if such spending might be justified by economic conditions. The deficits worsen because of a combination of spending increases (some of this counter-cyclical), recessions (causing receipts to decline), and large tax cuts.

#### SCHOOLS OF THOUGHT

Now that we have established that the Fiscal deficit is real, and have provided some possible explanations as to the causes of the increased deficits, let us move to the consequences associated with deficit spending. Economic theory supports three views of the economic consequences of deficits. The Chartalists, such as William Vickrey, see deficit spending as necessary to achieving full employment.

Vickrey, the 1996 recipient of the Nobel Prize in economics, asserted that we needed to "...stop thinking of government deficits and inflation as prime evils; full employment will require large government deficits..." (Vickrey, 1997).i Furthermore, he also asserts that in a fiat monetary system, deficit spending is required in order to create money in the first place. To claim otherwise is to not understand how fiat money works.

It is an open question, perhaps, as to whether Vickrey would have held onto his argument given the realities of the current levels of deficit spending, but nothing in his modeling indicates he would have abandoned it. As stated above, deficit spending is required to create money. Money, according to the Chartalists, is a creation of the state and it is the state that determines the value of money. It can print as much as it needs to pay the deficit and debt.ii

]John Maynard Keynes saw deficit spending as a counter-cyclical policy that was, at least in part, selfcorrect. The Keynesian multiplier impact is too familiar to need repeating here. There are only a couple of things that need reiterating. According to Keynesians, of various stripes, deficit spending can increase growth not only by increasing consumer demand, but also by spurring business confidence. The stimulation of business confidence will generate increased business spending which can favorably impact GDP as well as potential GDP.iii

Neo-classical and Austrian economists see deficits as having detrimental impacts on economic growth through, in the case of Neo-classical economists, a crowding-out effect and in the case of Austrians, causing harmful inflation pressures.

The Neo-classical economics assertion that deficit spending crowds out private spending through interest rate effects has received some empirical support in the literature. Sanders, 1986, for example, found that deficits did indeed harm capital formation because of the resulting rise in nominal interest rates. Allune and Belton, 1993 and Cebula, 1995 found similar results in their studies.

Austrians, as is widely recognized, argue that government attempts at stabilization are, by definition, destabilizing. Markets work well and do not require the intervention of government. When government mistakenly intervenes, instability results. The business cycle is, in effect, a result of government action. As the only cause of inflation, for Austrians, is when the money supply outpaces money demand, accommodating monetary policy would be inflation, generating rather than ameliorating economic instability.

#### THE MODEL

No matter to which school of thought you adhere, it is a testable hypothesis as to whether, what direction and by how much deficits impact growth. Gershon Feder, 1983, provided a useful model for testing this empirically.

Feder analyzed the impact of exports on economic growth with the use of a cross-sectional study of countries. His independent variable was the growth in GDP. The causal variables included changing labor force participation rates, gross private domestic investment and the rate of change in exports. His study found a statistically significant and positive relationship between export growth and economic growth.

We adapted the Feder model by using US data over time and replacing the growth in exports variable with the growth in deficit spending. Further, we lagged the deficit spending variable under the assumption that it is deficit spending three periods ago would impact growth in the current period. Model specification, then, is:

# $\dot{Y} = \beta 0 + \beta 1 \dot{Z} + \beta 2 K + \beta 3 \dot{D} t - 3 + e$

Where  $\dot{Y}$  is the change in GDP,  $\dot{Z}$  is the change in labor force participation, K is the change in the capital stock (Gross Private Domestic Investment) and  $\dot{D}$  is the change in the Fiscal Deficit. The model asserts that the growth in GDP is a function of the growth in both labor and capital as well as the lagged growth in deficit spending.

# REGRESSION ANALYSIS: % Change GDP versus % Change LFP, GPI, % Change S/D

The regression equation is:

% Change GDP = 0.0704 + 3.05 % Change LFP - 0.000009 GPI + 0.00270 % Change S/D

Table 1									
Predictor	Coef	SE Coef	Т	Р	VIF				
Constant	0.040392	0.005198	13.54	0.000					
% Change LFP	3.0538	0.6972	4.38	0.000	1.247				
GPI	-0.00000927	0.00000451	-2.05	0.045	1.234				
% Change S/D	0.002698	0.001319	2.05	0.045	1.015				
S = 0.0259661	R-Sq = 40.4%	R-Sq(adi) = 37.4%							

# Table 2: Analysis of Variance

Source	DF	SS	mS	F	Р	
Regressions	3	0.0270033	0.0090011	13.35	0.000	
Residual Error	59	0.0397802	0.0006742			
Total	62	0.0667835				

<u>Table 3</u>			
Source	DF	Seq SS	
% Change LFP	1	0.0214209	
GPI	1	0.0027602	
\$ Change S/D	1	0.0028222	

# Table 4: Unusual Observations

% Chang	e					
Obs	LFP	% Change	GDP	Fit	SE Fit Residual	ST Resid
2	0.0023	0.00663	0.06028	0.00913	-0.05365	-2.21R
3	0.0020	0.17246	0.06790	0.00586	0.10457	4.13R
13	-0.0015	0.02120	0.03246	0.01681	-0.01126	-0.57 X
33	0.0016	0.12216	0.07060	0.00348	0.05157	2.00R
66	-0.0093	-0.02769	0.02197	0.00955	-0.04966	-2.06R
D D ( .		91	1	- 1		

R Denotes an observation with a large standardized residual

X denotes an observation whose X value gives it large leverage

We see in the results above that deficit spending does in fact have a statistically significant impact on growth and that the impact itself is positive. Looking also at the statistical variables above, we note that the model does seem to be somewhat accurate in its assumptions, based on a 40% R-squared being acceptable.

# FURTHER RESEARCH

There are several routes we wish to take with this model in future research. We would like to determine if these results are generalizable by conducting a cross-sectional study which would include other economies. We would also like to determine if the cause of the deficit is instrumental in our results.

In other words, if we broke up the years to take account of what caused the deficit (war v. stimulus, for example), would we get different results? This might be accomplished through the utilization of indicator variables for war years. Finally, we would like to take into consideration the State budgetary stance in the analysis. It might be that deficits are indeed stimulative but the fact that states must maintain balanced budgets, which would largely contractionary in a recessionary setting, offset the fiscal budget.

# **ENDNOTES**

<sup>i</sup> Also see Vickrey 1986.

<sup>11</sup>For an interesting discussion of the limits, see Hannsgen and Papadimitriou, 2010. <sup>III</sup>See Eisner, 1986

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# Welfare Effect of Consumption Taxes

# Qian Li<sup>\*</sup>

#### ABSTRACT

Tax reform is a recurrent topic, but most of the prevailing proposals are fail to promote either efficiency or equity. In this paper, we consider an alternative reform, a consumption tax reform. The results show that aggregate capital, labor and consumption are improved by replacing a labor income tax with a consumption tax.\*\* Moreover, a progressive consumption tax alone can achieve a significant welfare gain, and the welfare gap between the rich and the poor is reduced.

Keywords: Incomplete markets, Consumption taxes, Welfare inequality

#### **1 INTRODUCTION**

Given the current government deficit, highly unequal distribution of tax burden and extremely complexness of the tax system, a tax reform is crucial. However, most of the tax reforms, which aim at adjusting income tax codes, are at the cost of either efficiency or equity. Therefore, many political and business commentators have argued that consumption tax reforms might be the solution to the efficiency-equity trade-off.

There's vast agreement\*\*\* that consumption taxes can exempt saving from taxation, thus boost aggregate capital and output. But whether consumption taxes can contribute to reduce welfare inequality is left unknown. Corriea (2010) argues that a consumption tax can lead to a lower level of inequality. But however, her results are obtained by the assumption that all taxes are flat and under a complete market setting, hence the aggregates are not affected. Therefore, in this paper, we consider an incomplete market. The numerical results show that with incomplete market, replacing a flat labor tax with a flat consumption tax can increase aggregates and reduce welfare inequality. This is because the consumption tax reform encourages saving, so the interest rate decreases while the wage rate increases, and by a larger amount than the increase in consumption tax. As a result, low-asset households, who largely depend on labor income, would have an income increased more than consumption tax, so consumption increases. Whereas high-asset households, who gain their income mainly through capital returns, might experience a decrease in their consumption.

However, in a more realistic case, where the labor tax is progressive, the welfare inequality of levying a flat consumption tax instead of a progressive labor tax is actually enlarged. This results have been

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shown by some existing literatures, like Alig et al. (2001), Feenberg (1997) and Auerbach (1983) etc.. Although most of these works are under the framework of OLG model, the results of broadened welfare gap in both OLG model and Aiyagari (1994) model are straightforward to interpret. That is by eliminating a progressive labor tax, low-asset households, most of whom are also with low productivity, do not have much improvement in income, but are made to pay a higher consumption tax. Thus, the reform might make them worse off. High-asset households, who are more likely to have high labor efficiency, on the other hand, are no longer subject to a previous high labor tax. For theses households, an increase in income outweighs the increase in consumption tax, thus they are better off after the reform.

Regarding the welfare loss by switching from a progressive labor tax to a flat consumption tax, Seidman (1997) proposed UAS tax, in which he argues that consumption tax should be progressive. In principle, people should be taxed based on what they take from the economic pie, the more one takes, the less he leaves for the others. Therefore, a surcharge on top of a flat consumption tax is necessary, and this forms a progressive consumption tax. Moreover, Gentry (1997) also mentions that consumption taxes should be at least as progressive as labor taxes, but without a numerical confirmation. Thus, in this paper, we numerically implement the reform that moves from a progressive labor tax to a progressive consumption tax with the same progressivity under a balanced government budget. The welfare effect is quite significant and Gini indexes of consumption equivalent is brought down by 3%.

Though long-run consequence of a tax reform should be considered in a tax reform, short term effect is at the center of the issue. Thus, we also examine the transition path of the progressive consumption tax reform and find a appealing welfare gain in short-run; whereas the flat consumption tax reform leads in a welfare loss.

The rest of the paper is organized as follows. Section 2 presents the model. In Section 3, we first calibrate the model, then show the numerical results at steady states for different scenarios and during the transition paths. Section 4 concludes the paper.

#### 2. THE MODEL

Households: Households are endowed with 1 unit of time each period, which they divide into consumption and leisure. The preference over sequences of consumption takes the form

$$\operatorname{Max}\{c_t; k_{t+1}; h_t\} \sum_{t=0} E_0 \beta^t u(c_t; I_t)$$

where ct and It are consumption and labor at period t respectively,  $\beta \in (0;1)$  is subjective discount factor, and E0 denotes the conditional expectation at date 0. The period utility function u(c) satisfies Inada condition. Each period, households receive an idiosyncratic labor shock  $\epsilon$ , which is i:i:d: across households and follows the Markov process with transition matrix p( $\epsilon$ t+1 | $\epsilon$ t). Therefore the budget constraint of a household is

 $(1+T_c)C_t + a_{t+1} = (1+r^J)a_t + (1-T_w)w_t l_t \varepsilon_t$  $a_{t+1} \ge b$  $a_0 \text{ is given}$ 

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Throughout the paper, we assume household cannot borrow, which means that the borrowing limit b is 0.

Production: There is a representative firm who borrows capital and labor from households to maximize profits according to max{Kt ;Lt} AF(Kt ;Lt)-(rt + $\delta$ )Kt -wLt, where  $\delta$  is the depreciation rate. This maximization problem leads to rt = AFK(Kt ;Lt)- $\delta$ , wt = AFL(Kt ;Lt), where Kt and Lt denote aggregate capital and labor at period t, FK and FL are first order derivatives with respect to capital and labor respectively.

Government: The government has a consumption of G each period, and the revenue is collected from taxing consumption, capital and labor, G =TCCt +TartKt+TwwtLt. Assume that the government keeps a balanced budget.

Market clearing: The asset and labor markets clearing requires that the total asset and labor supplied by the households equals the total capital and labor that the firm uses for production. The good market clearing condition equates the total output to the sum of aggregate household investment and consumption, plus government consumption.

Equilibrium prices and allocations are characterized by firm demand functions, household and government budget constraints, market clearing conditions.

#### **3 NUMERICAL RESULTS**

This section presents the quantitative results of incomplete market models. First, we outline experiments and discuss the calibration for the benchmark economies. Then we study the effect of switching from labor income taxes to consumption taxes in different scenarios.

## 3.1 OUTLINE OF EXPERIMENTS AND CALIBRATION

Regarding the types of labor taxes, and labor choices, we conducted four groups of experiments. We study the effects of flat consumption tax reforms by starting from the simplest case where the labor tax is flat, and labor choice is inelastic. Then we show that the results are robust if labor supply is allowed to change. Later on, we consider a more realistic case, in which labor tax is progressive. As before, we discuss the economies with inelastic labor and elastic labor respectively. At last, we proceed to a progressive consumption tax reform in an economy, which initially has a progressive labor tax, and elastic labor supply. Period utility form is of King et al (1988) class (KPR henceforth),  $u(c; I) = (c(1-I)\gamma)1-\sigma/(1 - \sigma)$ . We set relative risk averse parameter  $\sigma = 2$  in all benchmarks.  $\gamma$  calibrated such that average hour worked is 0.3 in benchmark economies. The production function is Cobb-Douglas,  $F(K;L) = AK\alpha L1-\alpha$ , with  $\alpha = 0.36$  to match the capital's share in production. A is normalized so that output is equal to one in the deterministic steady state of benchmark economies. We calibrate b to match capital to output ratio of 3 at the stationary equilibrium in benchmark economies. The depreciation rate d is set to be 0:06, such that investment to output ratio is around 2. Table 1 shows the parameters in four benchmark economies.

Economy	Proper	ties	Parameters				
	Labor Tax Type	Labor Choice	А	β	Ŷ		
Benchmark a	Flat	Inelastic	0.612	0.907	1.77		
Benchmark b	Flat	Elastic	0.631	0.900	1.77		
Benchmark c	Progressive	Inelastic	0.591	0.917	1.60		
Benchmark d	Progressive	Elastic	0.675	0.912	1.60		

# Table 1: Parameters

# **3.2 STEADY STATES**

# A. FROM A FLAT LABOR TAX TO A FLAT CONSUMPTION TAX, INELASTIC LABOR

Anagnostopoulos and Li (2012) shows that with KPR utility flat consumption taxes do no distort saving decisions, thus the change in aggregate capital stems from the removal of labor taxes. Consider the partial equilibrium, in which interest rate and wage remain the same after the reform. Eliminating labor taxes increases labor income by 37%<sup>+</sup>, implying that the stochastic part of income takes up a larger proportion in aggregate income. As a result, stronger precautionary motives stimulate more savings from all types of households, so aggregate capital raises. Back to general equilibrium, higher aggregate capital yields higher wage rate and lower interest rate. Shown in Table 2, on one hand, a 8:55% rise in wage rate further amplifies the uncertainty of income, thus more precautionary savings are spurred; On the other hand, a 27:17% drop in interest rate depresses households savings. But nevertheless, the impact on aggregate savings of a higher wage rate dominates that of a lower interest rate. Therefore, aggregate capital increases after the reform. Since capital is below the golden rule level, the increase in capital results in the raise in the sum of consumption and government revenue. Thus, given a fixed government spending, aggregate consumption follows aggregate capital, improving by 6:81%.

The changes in aggregate variables are broken down into details, displayed in Table 3. From an income point of view, a flat consumption tax reform favors households either with low assets or with high labor efficiency. This is because eliminating the labor tax can promote wage income but reduce capital returns. Households with low assets or high labor efficiency are usually with high labor-to-capital ratio. Thus the impact on income of a higher wage is stronger than a lower interest rate. With higher income, households have tendency to increase consumption.

Anagnostopoulos and Li (2012) also proves that with KPR utility, other things equal, the ratio of households, consumption under two consumption taxes is inverse to the ratio of the two taxes. That is, if the elimination of the labor tax alone, with no consumption tax, promises a household with type (a; $\epsilon$ ) a consumption c0(a; $\epsilon$ ), then after a consumption tax rc is adjusted to balance government budget, the household's consumption c1(a; $\epsilon$ ) satisfies c1(a; $\epsilon$ ) = 1/(1+rc) c0(a; $\epsilon$ ). This property can provide some intuition to the impact on consumption of a flat consumption tax reform. The Table 3 shows that the reform raises shares in aggregate consumption for households in the first four asset quintile, while reduces the share for the top quintile. Consider households with no asset and the lowest labor efficiency. The removal of the labor tax increases wage, and thus total income by 8:55%. The numerical results shows that these households still have no saving after the reform. Therefore, all the increment of income is used to promote consumption, so consumption is increased by 8:55%.

government to maintain a balanced budget, a 28:99% consumption tax is levied. Thus the new consumption under the new consumption tax is 1=(1+28:99%) of the consumption after removing the labor tax but without a consumption tax. We proved with a complete market, after a flat consumption tax reform, wage increases more than that of consumption tax, and this result can be carried over to incomplete market models. Thus, consumption raises by 6:63% for households with no asset and the lowest labor shock. In general, households in lower asset quintile possess some asset both before and after the reform, but the amount is quite moderate. For example, the total asset held by the first four quintile is less than 10%. Thus, even households in low asset quintile are facing the decline in capital income, a more sizeable increase in wage than consumption tax is still possible to provide them with higher levels of consumption. The opposite occurs to households who belong to top asset quintile. If their labor efficiency, and thus labor income, are not high enough to cancel out the negative effect on consumption of a lower capital income and a higher consumption tax, then their consumption decreases. As shown in Table 2, with consumption being more equally distributed among households, Gini index of consumption drops.

# Table 2: Steady State of a

	Parameters								
Economy	T <sub>c</sub>	Tw	r(e-2)	W	K	Н	L	K/Y	С
Benchmark	0	0.269	6.00	0.551	4.32	0.30	1.67	3.00	0.830
Reform	0.290	0	4.37	0.599	5.43	0.30	1.67	3.47	0.886

Distribution of Wealth										
	Gini		C	Quintile			Т	Top Groups		
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%	
Ben	0.834	2.80e-3	2.81e-3	2.17	5.86	91.97	47.70	24.0	13.4	
FCT	0.855	2.88e-3	2.88e-3	1.76	4.09	94.14	51.25	25.82	14.36	
			Distributi	on of Co	onsumpti	on				
	Gini		C	Quintile			Т	op Group	S	
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%	
Ben	0.789	3.00	3.00	13.00	16.64	64.35	29.17	14.19	7.81	
FCT	0.810	3.24	3.24	13.08	17.14	63.29	29.21	14.16	7.75	

# Table 3: Distribution of a

# B. FROM A FLAT LABOR TAX TO A FLAT CONSUMPTION TAX, ELASTIC LABOR

When labor choice is brought into the picture, all the previous results go through: aggregate capital and consumption increases, Gini index of consumption decreases, except that we need to add one more dimension to our analysis.

Since Anagnostopoulos and Li (2012) shows that a flat consumption tax do not distort labor decision for KPR class of utility, the change in labor supply comes from the removal of labor tax. The elimination of labor tax rises wage rate, and with respect to different levels of assets and labor shocks, households' reactions to the rising wage are also different. For households with same labor efficiency, the income effect and the substitution effect of higher wage on labor-leisure decisions are the identical because with

the same labor shock, the increase in labor income and opportunity cost of leisure are the same. Therefore, if interest rate is unchanged, then labor supply should increase (decrease) by the same amount across households with different assets. However, encountering a decrease in interest rate, households with higher assets are also suffering from a shrinkage in capital income, resulting in a less increase or even a decrease in total income, so the budget is tightened. It follows that leisure reduces, labor supply increases. But for households with low asset holdings, they do not experience a big drop in capital income, so total income is still probably higher than pre-reform. Thus a relaxed budget might lead to higher leisure, and low labor supply. Our numerical results confirm this analysis, that Gini index of leisure decreases from 0.187 to 0.159. In general, the increase in labor supply of high-asset households outweighs the decrease of their counterpart. As a result, average hour worked rises by 0.011. Since households with high assets also tend to have high labor efficiency, the effective labor is increased by 0.068, a larger magnitude than that of average hour worked.

Comparing to the previous case, where labor supply is fixed, a higher effective labor further amplifies the stochastic part of income, therefore, precautionary savings increases by more.

## C. FROM A PROGRESSIVE LABOR TAX TO A FLAT CONSUMPTION TAX, INELASTIC LABOR

In this experiment, we start from a benchmark economy, which has a progressive labor tax. The functional form of labor tax is adopted from Gouveia and Strauss (1994), who estimated the functional form of US income tax code.  $T = \kappa 0 (y - (y - \kappa 1 + \kappa 2) - 1/\kappa 1)$ , where y is labor income. Parametersk0 andk1 govern the average tax rate and the progressivity respectively, andk2 is used to balanced government budget. In this paper we adopt the values of parameters from Anagnostopoulos et al. (2010), who estimatek0 = 0:414,  $\kappa 1 = 0:888$ , and $\kappa 2 = 1:34$  following the same procedure as Guvenen et al. (2012), using PSID data covering the time period from 1983 to 2003.

The impact on aggregates of removing a progressive labor tax is similar to that of removing a flat labor tax. Because higher wage creates greater uncertainty over income, higher precautionary capital is accumulated to insure against a more volatile income.

But on individual level, the results are reversed. After the reform, the share in aggregate consumption decrease for the first four asset quintile, but increases for the households in top 20% of asset distribution, as well as the top groups. Consequently, Gini index of consumption increases. The explanation is straightforward: low-asset households are not benefit much from the elimination of labor tax because most of them also possess low labor efficiency, but paying a high consumption tax makes them worse off. In contrast, high-asset households are exempt from the pre-reform high labor tax, and are only subject to a relatively low consumption tax. Therefore, they are in favor of the flat consumption tax reform.

#### D. FROM A PROGRESSIVE LABOR TAX TO A FLAT CONSUMPTION TAX, ELASTIC LABOR

When labor supply is allowed to vary, the results of moving from a progressive labor tax to a flat consumption tax is consistent with the results obtained by a fixed labor; and the analysis of the effects on aggregate labor is analogous to that in b, where the labor tax is flat. Regardless of the type of the labor tax, as long as it is removed, wage rate increases and interest rate decreases. As a result, labor supply decreases for households with low assets, but increases for their counterpart with high asset possession. Thus Gini index of labor decreases. But the decrease in inequality of labor supply is by less amount when initial labor tax is progressive as oppose to initially a flat labor tax. This is because under a progressive labor tax region, low-asset households do not pay a labor tax as high as under a flat labor tax region, the elimination of the progressive labor tax causes a less improvement in labor income, so the income effect plays a less dominant role as compared to the elimination of a flat labor tax. The same argument can be applied to households with high assets: the removal of a progressive labor tax indicates a more sizeable improvement in labor income. Thus, income effect has stronger impact on their labor decision. As a result, the extent to which the poor reduces labor supply, and the amount by which the rich increases labor supply are both lower when initial labor tax is progressive. But in general, the increase in labor supply the the rich outweighs the decrease by the poor, aggregate labor increases after the reform. In comparison to the case with fixed labor, higher aggregate labor results in a greater boost in aggregate capital accumulation.

# E. FROM A PROGRESSIVE LABOR TAX TO A PROGRESSIVE CONSUPTION TAX, ELASTIC LABOR

It has been mentioned in some existing literature that a progressive consumption tax might be the solution to welfare inequality<sup>++</sup>, thus in this subsection, we consider a progressive consumption tax reform. Due to the fact that there is lack of literature discussing the optimal progressivity of consumption taxes, we apply the same functional form and progressivity as the labor tax to the consumption tax. Besides, we set k2 in consumption tax function the same as that in labor tax function, and adjust k0 to balance government budget. The aggregate variables are shown in Table 4.

As before, the elimination of a labor tax amplifies the stochastic part of income, such that aggregate capital increases. But a progressive consumption tax distorts savings, thus the increase in aggregate capital also comes from the disproportional consumption tax rate. The lagrangian multiplier of the budget constraints of a flat consumption tax is  $uc(c;I)/(1+\tau c)$ , and that of a progressive consumption tax is  $uc(c;I)/(1+\tau c)$ , where T'c (c) is the marginal consumption tax rate with respect to consumption c. Suppose that the progressive consumption tax reform yields the same equilibrium as the previous flat consumption tax reform and consider low-asset households with the consumption c such that T'c (c) <\tau c) <\tau

Even though the discrepancy of capital holding is widened, which is indicated by the increase in Gini index of wealth, the progressive consumption tax enables households at the low ends of both wealth distribution and labor efficiency distribution higher levels of consumption. The first order condition under the progressive consumption tax is

 $uc(c;n)/(1+T'c(c)) = \beta E(1+rT) uc(c';n')/(1+T'c(c'))$  (6)

If the equilibrium allocations are the same as that under a flat consumption tax, and suppose that households with low assets and low labor efficiency and with the consumption such that T'c (c) <rc. Then the marginal cost of saving, the left hand side of (6), is likely to exceed the marginal benefit, the left hand side of (6). This is because with a better shock tomorrow, consumption increases, implying T'c (c) is higher, which might exceedsrc. Therefore, in order for the Euler equation to hold, households should increase current consumption. In contrast, households with high assets and labor efficiency are more likely to have marginal cost of saving less than the marginal benefit, which suggests them to reduce consumptions. As a result, consumption is more equally distributed among households. Although Gini index of consumption is slightly higher after the progressive consumption tax reform, it is much lower than that of a flat consumption tax reform. If we take into account the increase in aggregate consumption, then households in low quintile have higher levels of consumption than pre-reform.

A higher marginal cost of saving for households with low assets and low labor efficiency also indicates a higher level of leisure. The intratemporal substitution between leisure and consumption is given by  $u1(c;1-n)/(1+T'c(c)) = -u2(1-n)/w\epsilon$ . A higher marginal utility of consumption under progressive consumption tax region than a flat consumption tax region suggests a higher disutility of labor. Therefore, low income households increase leisure by reducing labor supply, and high income households perform the opposite, so Gini index of labor decreases. Aggregate labor is dominated by households with high labor efficiency, so total efficient labor increases by 6:25%.

			Parame	eters					
Economy	(K <sub>c0</sub> , K <sub>c1,</sub> K <sub>c2</sub> )	(K <sub>I0</sub> , K <sub>I1,</sub> K <sub>I2</sub> )	r(e-2)	W	K	Н	L	K/Y	С
Benchmark	(0,-,-)	(0.414,0.888,1.34)	5.98	0.643	5.81	0.300	1.92	3.00	1.04
PCT	(0.449,0.888,1.34)	(0,-,-)	3.07	0.743	5.43	0.316	2.04	3.88	1.27

Table 4: Steady State of e

Distribution of Wealth									
	Gini		(	Quintile			Т	op Group	S
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%
Ben	0.825	0	0	2.01	6.63	91.35	42.22	19.66	10.44
PCT	0.845	0	0	1.86	3.99	93.98	47.17	22.05	11.66
Distribution of Consumption									
	Gini		(	Quintile			Т	op Group	S
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%
Ben	0.569	4.03	4.03	14.87	17.14	59.93	26.31	12.43	6.66
PCT	0.579	3.90	3.90	14.34	17.85	60.00	28.02	13.32	7.10
			Distr	ibution o	f Labor				
	Gini		(	Quintile			Т	op Group	S
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%
Ben	0.185	24.15	24.15	22.88	19.08	9.75	3.29	1.56	0.839
PCT	0.165	23.30	23.30	22.47	20.96	9.97	3.69	1.78	0.952

# Table 5: Distribution of e

# **3.3 TRANSITION**

In this section, we present the transition paths of switching from a progressive labor tax to a flat consumption tax and to a progressive consumption tax respectively. In both reforms, we eliminate labor income tax once and for all. Then we adjust rc in the flat consumption tax case to maintain government spending; similarly we rebalance government budget by changing  $\kappa 0$  in the progressive consumption tax case, while keeping $\kappa 1$  and $\kappa 2$  fixed. In both case, average consumption tax rate has an immediate jump after the labor tax is eliminated. This is because both capital and labor remain at the low levels, in order to balance government budget, a higher-than-steady-state consumption tax rate gradually decreases to the new equilibrium level. Because of the monotonic decrease in consumption tax rate, by Euler equation, interest rate keeps on dropping, which implies that aggregate capital experiences a smooth increase throughout the transition. Labor income increases right after the reform, substitution effect dominates income effect results in a sudden increase in labor supply. With the increase in wage income, substitution effect becomes less dominant, hence aggregate labor drops and eventually converges to the new equilibrium level. Aggregate consumption follows the same pattern as capital, except an abrupt drop at the beginning because of the unexpected raise in consumption taxes.

Besides the transition path of aggregate variables, we also present the welfare effect on individual levels. After the flat consumption tax reform, all the households with the lowest shock suffer from a welfare loss, because the increase in wage income cannot compensate the increase in consumption tax. Since interest rate is dragged down by a larger capital accumulation, the higher the asset, the greater the loss in capital income. And this transfers to a more sizeable welfare loss of households with high asset holdings. Because of the welfare loss by the biggest bulk of population, aggregate welfare decreases by 11:53%. As compared to the flat consumption tax reform, a progressive consumption tax reform causes a welfare gain for 42% of households with lowest labor efficiency. And there are more households with

other two levels of labor efficiency experience larger welfare gain. Consequently, aggregate welfare increases by 3:32%.

# **4 CONCLUSION**

In this paper we study the effects of consumption tax reforms. In general, regardless of the types of labor tax and consumption tax, replacing a labor income tax by a consumption tax increases aggregate variables. There are two interpretations for this, first is that because higher wage increases the uncertainly of income, precautionary savings are stimulated; The other explanation is that financing government spending through a consumption tax exempt saving from taxation, therefore more capital is accumulated. This conclusion is in line with the argument by the advocates of consumption taxes. But with respect to welfare inequality, the results vary across experiments according to different assumptions about labor tax. If labor tax is flat before the reform, then a flat consumption tax can reduce the Gini index of consumption and leisure, and thus the inequality of welfare. Because the asset poor households have a wage income increases by a larger amount than consumption tax, and they are not subject to a decrease in capital income; whereas asset rich households, the benefit of higher wage income is cancel out by the shrinkage in the return of capital. However, if the labor tax is progressive, then imposing a flat consumption tax instead of of a progressive labor tax hurts the poor, because the poor are not benefit from much from the removal of labor tax large enough to guarantee a higher consumption and leisure. Thus welfare inequality increases. Because of this negative impact of a flat consumption tax reform on welfare, we consider a progressive consumption tax reform. Due to the fact that there is lack of studies of the optimal progressivity of consumption taxes, we apply the same progressivity as labor taxes to consumption taxes. The numerical results exhibits a sizeable welfare improvement of the progressive consumption tax reform. Our future work involves discussion of the optimal consumption tax rate and its progressivity.

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# **ENDNOTES**

\*\* The effect of replacing capital income taxes with consumption taxes is similar

- \*\*\* Like Hall (1995), Seidman (1995), Kaldor (1995), etc...
- + In partial equilibrium, the raise in labor income comes from the decrease in labor tax, thus it is 1 1+0:269 = 37%
- ++ Feenberg (1997), Domenici et al. (1995), Frank (2005), Gentry (1997)

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# APPENDIX





# Tail Dependence between Stock Index Returns and Foreign Exchange Rate Returns- a Copula Approach

# Fangxia Lin<sup>\*</sup>

#### ABSTRACT

The aim of this study is to estimate the tail dependence between stock index returns and foreign exchange rate returns for four East Asian economies. We apply the concept of copula to model the dependence structure in the tail area between the two returns series. My major findings are that South Korea and Indonesia have much stronger lower tail dependency than right tail, indicating that the higher probability of double losses than double gains. Taiwan has symmetric tail dependence with similar upper and lower tail coefficients. In the case of the more advanced economy, there exists neither lower nor upper tail dependence.

#### INTRODUCTION

Understanding the dependence between risk factors is crucial in risk management and asset allocation. This study aims to examine the tail dependence between the stock index returns and exchange rate returns of four East Asian economies. Tail behavior of random variables during extreme events, such as financial crisis, can be captured via measures of tail dependence. In our case, tail dependence measures the probability that we will observe extremely large gain in the stock market, given that the local currency also has had a large appreciation against the USD. For a U.S. investor seeking international diversification, he/she will experience double large gains, one in the equity market, and the other in the currency market when translating the local currency investment into U.S. dollars. Likewise, when the stock market crashes, the foreign investor not only loses big in the stock market, but also in the currency market. Therefore, goal of risk reduction cannot be achieved due to this possibility.

The questions we endeavor to answer in this study are: 1) can investing in East Asian stock markets provide any diversification benefits? If we find positive tail dependence between the two markets, then we can claim that, for a U.S. investor, investing in the East Asian equity markets can't provide any risk reduction benefits when it is most needed (correlation breakdown). 2) are the tail dependency similar for the countries? 3) do the tails exhibit symmetric or asymmetric dependency in that economic region? By answering these questions we hope to better understand the co-movements of equity-currency markets for the selected countries in this economic region.

Extensive research has been done on the relationship between these two markets, both theoretically and empirically. On the theoretical ground, there are two models explaining the causal relationship between the equity and currency markets: one is the "stock oriented" model of exchange rate (Branson (1983) and Frenkel (1983)) and the other is "flow-oriented" model of exchange rate (Dornbusch and

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Fisher (1980)). From the microeconomic point of view, local currency appreciation can cause exporting firms competitive disadvantage, therefore lowering their stock prices, indicating negative relationship between stock returns and exchange rate. On the other hand, importing firms can benefit from home currency appreciation, suggesting a positive relationship between these two markets. From the macroeconomic point of view, if domestic interest rate is higher relative to the rest of the world, the higher demand for home currency leads to its appreciation. In the meantime, higher interest rates also increase domestic firms borrowing cost, causing lower stock prices. This suggests a negative relationship between these two markets. Mixed results have been documented on the causal relationship between these two markets. Using the ordinary least squares (OLS) estimation, Solnik (1987) finds weak positive relationship for monthly data but negative relationship for quarterly data for eight western markets. Based on error correction model (ECM), Ajavi and Mougoue (1996) find that, in the short run, the relationship between stock prices and home currency is negative, but positive in the long run. Using a GARCH approach, Patro et al. (2002) find significant currency risk exposure in country equity index returns for 16 OECD countries. Using Granger causality test, Pan et al. (2007) study the dynamic linkages between exchange rates and stock prices for several East Asian countries. They find a significant causal relationship from exchange rates to stock prices before the 1997 Asian financial crises.

The conventional dependence measure is constructed as an average of deviations from the mean and it doesn't distinguish between large or small realizations or between positive and negative returns. And it is based on assumptions of a linear relationship and a multivariate Gaussian distribution. Since the research of Embrechts et al. (2002) identified the limitations of correlation-based models in risk management, copula method has become more popular an approach in modeling dependence structure between financial variables. Copulas can capture dependence throughout the entire distribution of asset returns, independent of the univariate returns distribution. Not only can copulas model the degree of dependence, but also the structure of dependence. Works using copulas include Mashal and Zeevi (2002), Hu (2006), Chollete et al. (2006, 2009), and Rodriguez (2007) on the dependence structure across international equity markets, Patton (2006) on dependence structure on currency markets, and Ning (2010) on the dependence between equity-currency markets, just to name a few.

This study is similar to the previous literature in the sense that it also models dependence in international financial market returns. It is different from the existing works and contributes to the literature in the following way: first, the countries and data period are different; secondly, this paper studies the degree of tail dependence using unconditional copulas as well as conditional copulas. Our key empirical result reveals that the tail dependence coefficient is significant for the three East Asian emerging markets, and for Singapore, there isn't enough evidence to support the existence of any tail dependency between the currency returns and stock index returns. Our findings have important implications in risk management and asset pricing. For global investors seeking to diversify their portfolio into emerging markets, ignoring the joint downside risk would underestimate the value-at-risk (VaR), which is a common market risk measure in risk management practice. Our finding should also affect the pricing of assets. As

pointed out by Phylaktis and Ravazzolo (2004), an international capital asset pricing model (ICAPM) will be mis-specified if currency risk is omitted. Poon et al. (2004) states that, tail dependence is a true measure for systematic risk in times of financial crisis and global investors should be compensated for exposure to such risk during joint market down turns.

The remainder of this paper is organized as follows. Section 2 introduces copula concepts and measure of tail dependence. Section 3 specifies the models and estimation method. In section 4, we describe the data used and present the empirical evidence of extreme co-movements. We offer concluding remarks in section 5.

#### COPULA CONCEPTS AND TAIL DEPENDENCE

Dependence between random variables can be modeled by copula method. In this section we introduce the general concept of copulas and some copulas used to model tail dependence in finance literature. Copulas represent a statistical tool to measure the dependence structures between financial markets, risk factors and other relevant financial variables. Copula method to model dependence is becoming more and more popular among academics and practitioners in the field of finance due to the inability of the linear correlation to handle the fat-tail problem in financial returns. There are some advantages of copula method over traditional methods: one is that copulas allow modeling nonlinear dependence structure; secondly, no assumption required regarding the marginal distributions; lastly, we can also use copulas to model tail events, which is often a paramount concern in financial risk management.

As described in Joe (1997), a copula is a multivariate distribution function that is used to bind each marginal distribution function to form the joint distribution function. Copulas parameterize the dependence between the margins, while the parameters of each marginal distribution function can be estimated separately.

## SKYLAR'S THEOREMS AND COUPLAS

The theorem central to the theory of copulas is called Sklar's theorem. In 1959, A. Sklar (1959) created a new class of functions now known as copulas, which couple a joint distribution function to its univariate marginals. We will present this theorem mainly by following Nelson (1999).

Sklar's Theorem (Sklar 1959).Let H be a joint distribution function with marginals F and G. then there exists a copula C such that for all x, y in R,

$$H(x,y) = C(F(x),G(y))$$
<sup>(1)</sup>

If F and G are continuous, then C is unique; otherwise, C is uniquely determined on RanF ×RanG. Conversely, if C is a copula and F and G are distribution functions, then the function H defined by the above equation is a joint distribution function with marginals F and G.

Definition 1: A two-dimensional copula is a function  $C:[0,1]^2 \rightarrow [0,1]$  which satisfies the following properties:

- (a) Grounded: for every u, v in [0,1], C(u,0) = 0 = C(0,v);
- (b) C(u, 1) = u and C(1, v) = v for all  $(u, v) \in [0, 1]^2$ ;
- (c) 2-increasing: for every  $u_1, u_2, v_1, v_2$  in [0,1] such that  $u_1 \le u_2$  and  $v_1 \le v_2, C(u_2, v_2) C(u_2, v_1) C(u_1, v_2) + C(u_1, v_1) \ge 0.$

Hence, any bivariate distribution function whose margins are standard uniform distributions is a copula. From the definition, we know that copulas are joint distribution functions of standard uniform random variables:

$$C(u, v) = \Pr(U_1 \le u, U_2 \le v)$$

For a more detailed treatment of copulas, the reader can refer to Joe (1997) and Nelson (1999). For an overview of copula applications in finance, see Cherubini et al. (2004) and Patton (2009) for copula applications in financial time series.

# Measure of tail dependence

Tail dependence refers to the amount of dependence in the tails of a bivariate distribution or alternatively the dependence in the corner of the lower-left quadrant or upper-right quadrant of a bivariate distribution. Tail dependence between two random variables is a copula property and hence the amount of tail dependence is invariant under strictly increasing transformations of X and Y. For two random variables X and Y with marginal distributions  $F_X(x)$  and  $F_Y(y)$ , the upper tail dependence is

$$\lambda_r = \lim_{u \to 1} \Pr[F_Y(y) \ge u | F_X(x) \ge u] = \lim_{u \to 1} \frac{1 - 2u + C(u, u)}{1 - u}$$
(2)

and the lower tail dependence is

$$\lambda_l = \lim_{u \to 0} \Pr[F_Y(y) \le u | F_X(x) \le u] = \lim_{u \to 0} \frac{c(u,u)}{u}$$
(3)

where  $\lambda_r$  and  $\lambda_l \in [0,1]$ . Positive  $\lambda_l$  or  $\lambda_r$  indicates that X and Y are to be tail dependent. If the tail dependence coefficient is zero, the variables are asymptotically independent. However, tail independent does not mean that the variables are independent. The copulas with different tail dependence structure applied in this study are introduced in the next section.

#### ESTIMATION METHOD AND MODEL SPECIFICATION

Generally speaking, there are two approaches to estimate copula models, one is the one-stage full maximum likelihood estimation method, and the other is the two- stage inference functions for margins (IFM) method proposed by Joe and Xu (1996). The one-stage approach jointly estimates the parameters of the marginal models and parameters of the copula models simultaneously. Given the large number of parameters, this method can be computationally intensive and make the numerical maximization of the log likelihood function difficult. Therefore, in practice, the two-stage IFM method is preferred due to its computational tractability. Under the IFM approach, the first step models the marginal models, either parametrically or non-parametrically. If estimation is done non-parametrically, then the method is a semi-

parametric two-step estimation method, also known as Canonical Maximum Likelihood, or CML method. Copula parameters are estimated in the second step. For more details on this estimation method, interested reader can refer to Cherubuni et al. (2004). Joe (1997) points out that the IFM is a highly efficient method, and he proves that the IFM estimator is consistent and asymptotically normal under standard conditions.

### THE MARGINAL MODELS

We model the marginal distributions parametrically using GARCH type models. In the finance literature, a very common approach to model time series is the generalized autoregressive conditional heteroskedasticity (GARCH) model. In particular, we filter the raw returns data with a AR(k)-GARCH(p, q) or AR(k)-t-GARCH(p, q) type models. This type of models has been used in Bollerslev (1987), Patton (2006a), and Ning (2010) among others. The marginal model is specified as follows:

$$r_{i,t} = C_i + \sum_k AR_{i,k} \times r_{i,t-k} + \varepsilon_{i,t}$$
(4)

$$\sigma_{i,t}^{2} = Arch0_{i} + \sum_{p} Garch(p)_{i} \times \sigma_{i,t-p}^{2} + \sum_{q} Arch(q)_{i} \times \varepsilon_{i,t-q}^{2}$$
(5)

where  $r_{i,t}$  is the returns for country *i* at time *t*,  $\sigma_{i,t}^2$  is the variance of  $\varepsilon_{i,t}$  term in the mean equation (equation (4)). Estimation results of the marginal model are discussed in subsection 4.2.

# Static copula models

### Student's t-copula

The Student's t- copula is based on the multivariate t distribution, in the same way as the Gaussian copula is derived from the multivariate normal distribution. The copula of the bivariate Student's t-distribution with a degree of freedom of v and correlation  $\rho$  is

$$C_{v,\rho}^{t}(u,v) = \int_{-\infty}^{t_{v}^{-1}(u)} \int_{-\infty}^{t_{v}^{-1}(v)} \frac{1}{2\pi\sqrt{1-\rho^{2}}} \left\{ 1 + \frac{(s^{2}+t^{2}-2\rho st)}{v(1-\rho^{2})} \right\}^{-(v+2)/2} ds dt$$
(6)

As the value of v increases, say v = 100, it approximates a Gaussian distribution. The bivariate Student's t-copula exhibits symmetric tail dependence and has the tail independence Gaussian copula as a special case.

# **CLAYTON COUPULA**

Clayton copula belongs to the Archimedean Copula family and is known to have tail dependence. The bivariate Clayton copula can be written as the following

$$C_{\theta}^{cl}(u, v) = (u^{-\theta} + v^{-\theta} - 1)^{-1/\theta}$$
(7)

where  $0 < \theta < \infty$  is a parameter controlling the dependence,  $\theta \to 0^+$  implies independence, and  $\theta \to \infty$  implies perfect dependence. *u* and *v* are standard uniformly distributed i.i.ds. Clayton copula can be used to describe lower (left) tail dependence and no upper (right) tail dependence.

Symmetrized Joe-Clayton copula (SJC)

Symmetrized Joe-Clayton (SJC) copula allows both upper and lower tail dependence and symmetric dependence as a special case. The SJC copula is a modified version of the Joe-Clayton copula (Joe 1997), as proposed by Patton (2006a) and it is defined as follows.

$$C_{SJC}(u, v|\lambda_r, \lambda_l) = 0.5 \cdot (C_{JC}(u, v|\lambda_r, \lambda_l) + C_{JC}(1 - u, 1 - v|\lambda_r, \lambda_l) + u + v - 1)$$
(8)

where  $C_{lc}(u, v | \lambda_r, \lambda_l)$  is the Joe-Clayton copula defined as follows

$$C_{JC}(u,v|\lambda_r,\lambda_l) = 1 - \left(1 - \left\{\left[1 - (1-u)^k\right]^{-\gamma} + \left[1 - (1-v)^k\right]^{-\gamma} - 1\right\}^{-1/\gamma}\right)^{1/\kappa}$$
(9)

where  $k = 1/\log_2(2 - \lambda_r)$ ,  $\gamma = -1/\log_2(\lambda_l)$ , and  $\lambda_r \in (0,1)$ ,  $\lambda_l \in (0,1)$ . As pointed out in Patton (2006), the main drawback in Joe-Clayton copula is that, even when  $\lambda_l$  and  $\lambda_r$  are equal, there is still slight asymmetry in the copula. Given the way SJC copula is constructed, it is a better copula model to determine the presence or absence of asymmetry based on the empirical tail dependence measures. We discuss our empirical results based on SJC copula model.

#### Dynamic copula model

To examine time-varying tail dependence in the returns series, we use the time-varying SJC copula, as proposed in Patton (2006).

$$\lambda t = \Lambda(\omega + \beta \lambda_{t-1} + \alpha \cdot \frac{1}{10} \sum_{i=1}^{10} |u_{t-i} - v_{t-i}|)$$
(10)

where  $\Lambda$  denotes the logistic transformation to keep the tail dependency parameter of the SJC copula in [0,1] and it is defined as  $\Lambda(x) = (1 + e^{-x})^{-1}$ .

The dynamic copula model contains an autoregressive term designed to capture persistence in dependence and a forcing variable which is the mean absolute difference between u and v. The forcing variable is positive when the two probability integral transforms are on the opposite side of the extremes of the joint distribution and close to zero when they are on the same side of the extremes.

## DATA AND EMPIRICAL RESULTS

#### DATA

The dataset used in this chapter consists of daily closing stock index returns and foreign exchange rate movements for four East Asian economies (Indonesia, South Korea, Singapore, and Taiwan). The stock indices are the Jakarta SE Composite Index of Indonesia, the Korea Stock Exchange Stock Price Index (KOSPI), The Strait Times Stock Exchange of Singapore, and the Taiwan Stock Exchange Capitalization Weighted Index. The corresponding exchange rates are Indonesia Rupiah (US\$/IDR), Korean Won (US\$/KRW), Singapore dollar (US\$/SGD), and Taiwanese dollar (US\$/TWD). The dataset has different starting dates, but all end on June 4, 2010.

Table 1 presents summary statistics of the continuously compounded stock index returns and currency movements for each country, and all returns are in percentage terms. As manifested from the table, East Asian equity markets did provide higher returns (with the exception of Taiwan for the sample period), at the expense of higher risk, as measured by the sample standard deviation. Generally, the standard deviation of equity returns is higher than that of currency movements, with the exception of

Indonesia. The nonzero skewness measure and excess kurtosis all point to the non-normality of the returns. Our Jarque-Bera tests further confirm the non-normality of the returns data (not reported in the table).

Three traditional correlation measures are presented in TABLE 2: Pearson's linear correlation, the Kendall's tau, and Spearman's rho rank correlation coefficients. To see the dependence structure from our data, we also calculate the empirical copula for the country pairs (see Knight et al. (2005)). We first rank the pair of the returns series in ascending order and each series is divided evenly into 10 bins. Bin one includes the observations with the lowest values (in their lowest 10th percentile) and Bin ten includes observations in the top 10th percentile. The resulting table will show us how the two returns series are associated with each other. If the two series are perfectly positively related, we expect all the observations lie on the major diagonal. If they are negatively related, most observations should lie in the cells on the diagonal connecting the lower-left corner and upper-right corner. If there is positive right tail dependence, the number of observations in cell (10, 10) would be larger. We would expect a large number in cell (1, 1) if there exists positive left tail dependence. The empirical copula frequency counts for four country pairs are presented in TABLE 3. Comparing cell(1,1) and cell(10,10) of all country pairs, we observe that both upper tail and lower tail dependence are present for the sample period with a higher percentage of observations lying in the lower tail area.

#### **RESULTS OF THE GARCH MODELS**

The parameter estimates and standard errors for marginal distribution models are reported in TABLE 4 and TABLE 5. Only the highly significant (with 5% significance level at least) autoregressive terms and GARCH terms are reported in the table. For most of the return series, GARCH(1,1) is sufficient to model the conditional heteroskedasticity, but some require higher Arch/Garch terms. This is shown by significant Arch2, Arch3, and Garch8 terms for Indonesia currency returns. A Gaussian conditional probability is sufficient for most of the marginal models, except for the stock index returns of South Korea. In the next subsection, we discuss the results of the copula models.

Empirical results of the static copula models

Parameter estimates of the SJC copula, Student's t-copula, and Clayton copula models are presented in Table 7. We observe significant estimates of the parameters of the lower tail dependence as well as upper tail dependence for the three emerging markets, namely, Indonesia pair, South Korea pair and Taiwan pair. For Singapore, there is no evidence on tail dependence, i.e. the tail dependence parameters are not significant at either tail. Whereas Indonesia pair and South Korea pair have asymmetric tail dependence, Taiwan pair has symmetric tail dependence measure as the estimated parameters are not significantly different. The estimated degree of freedom (v) of the Student's t-copula ranges from 6.74 (Korea) to 16.06 (Taiwan), indicating bivariate non-normality between the returns distributions of the two markets for the countries under study. This further confirms that linear correlation coefficient as a measure of dependence between financial returns can give misleading results. For

Singapore, even though not enough evidence to show that there exist extreme co-movement between the equity-currency markets, but the estimated degree of freedom parameter of 12.12, indicating that bivariate normal distribution is not reasonably a good assumption in modeling the dependence between the two returns series.

Empirical results of the dynamic copula models

Next we look at the dynamics of the tail dependence measures. Since the static copula results indicate no tail dependence in Singapore financial markets, here we focus on the three emerging markets. We apply Patton (2006) time-varying SJC copula to examine the conditional bivariate distribution of the returns series for Indonesia, South Korea, and Taiwan. TABLE 8 reports the parameter estimates along with the static SJC copula results for convenience. Our empirical results show that the autoregressive term for both tails of Korea pair (lower tail  $\beta = 0.8947$ , upper tail  $\beta = 0.9737$ ), upper tail of Indonesia pair ( $\beta = 0.9210$ ), and lower tail for Taiwan pair ( $\beta = 0.9079$ ), is significant, indicating the high persistence in the dependence level. The parameters for the lower tail dependence coefficient of Indonesia pair are not significantly different from zero, indicating that there is no significant change in the degree of the tail dependence.

To illustrate the evolving time path of the degree of tail dependence coefficients, in Figures 1, 2, and 3, we plot the conditional upper and lower tail dependence implied by the time-varying SJC copula model. In the figures, we also plot the time-varying difference between lower tail and upper tail coefficients, as calculated by  $\lambda I - \lambda r$ . Under symmetry, this difference should be zero. From the bottom plot of Figures 1 and 2 we note that conditional lower tail dependence is greater than conditional upper tail dependence almost all the time for Indonesia pair and South Korea pair, supporting our conclusion of asymmetry in tail dependencies for these two pairs. In the case of Taiwan (Figure 3), the difference between the lower tail coefficient in the lower and upper tail parameter values, as we have concluded earlier based on unconditional copula results.

We can compare the relative performance of the competing copula models using Akaike's information criterion (AIC). For the three pairs, we find a reduction of the AIC in the time-varying SJC model (Korea pair decreased the most and Taiwan pair decreased the least), indicating the dynamic copula model performs better than their static counterpart.

## CONCLUSION

In this paper, we examine the degree of dependence at the extremes of the bivariate distribution between the stock index returns and foreign exchange fluctuations in four East Asian economies via copula methods. Using static copula models, our major findings are the following: 1) for the more advanced economy, namely Singapore, there is no evidence of tail dependence between the two returns series; 2) for the three emerging markets, Indonesia and South Korea have significantly higher left tail dependency than right tail dependency, thus asymmetric tail dependencies. For Taiwan, the tail

dependence is significant and similar between the lower and upper tail, suggesting symmetric tail dependence behavior.

We also employ Patton (2006) conditional SJC copula model to examine the dynamics of tail dependence coefficients between stock index returns and foreign exchange rate fluctuations for the three emerging markets. The empirical results show that the autoregressive term for both tails of South Korea pair, upper tail of Indonesia pair, and lower tail for Taiwan pair is significant, indicating the high persistence in the dependence level. Using graphical analysis, the conditional lower tail dependence is greater than conditional upper tail dependence almost all the time for Indonesia pair and South Korea pair, supporting the conclusion of asymmetry in tail dependencies for these two countries.

Our empirical findings have important finance implications in risk management and asset pricing. For investors seeking to diversify their portfolio into emerging financial markets, ignoring the joint downside risk would underestimate the value-at-risk (VaR), which is a common risk measure in risk management. Tail dependence serves as a true measure for systematic risk in times of financial crisis and global investors should be compensated for exposure to such risk during joint market downturns. These results can provide important guidance for investors who consider international diversification into this economic region. For international investors seeking diversification into Indonesia and South Korea stock markets, it is more likely for them experiencing extreme double losses (one in the stock market and the other in the currency market when translating into home currency returns) than extreme double gains, therefore hedging equity investments with currency derivatives is highly recommended. For investments made in the advanced market, currency hedging does not seem quite necessary.

### **ENDNOTES**

- 1. I am grateful for helpful suggestions from participants at the 38<sup>th</sup> Annual Conference of the Eastern Economic Association, Boston, MA, March 2012.
- 2. The tables and figures are available from the author upon request.

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# The Economic Dimensions of the Foreclosure Crisis

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#### ABSTRACT

This paper proposes to examine the significance of both loan/borrower characteristics and macroeconomic factors in the mortgage default and foreclosure crisis in the New York City metropolitan area in the years immediately preceding the collapse of the housing bubble. Matching the full set of 2010 New York State pre-foreclosure filings to home loans originated from 2004 through 2008; the proposal seeks to expand upon the scope of earlier studies, incorporating measures of macroeconomic conditions together with loan characteristics and borrower demographics. Following a review of the literature and of the relative success of loan modification programs, we conclude with a brief proposal for a comprehensive study.

#### INTRODUCTION

Since the foreclosure crisis began nearly six years ago, numerous efforts at stemming the rapid growth in foreclosure actions have been undertaken, at both the State and federal levels. An essential part of that process necessarily involved identifying the central reasons that homeowners entered into foreclosure since the collapse of the housing market following the unraveling of the subprime mortgage crisis in 2006. Despite recent indicators of the beginnings of recovery in some markets, the problem of foreclosure still remains a significant drag on the economic recovery and job growth. The discussion here is centered on a critical evaluation of the relative success rates of the various federal and state programs aimed at loan modification. A central conclusion of our research is that many of the modification programs failed, to a certain extent, to address the principal causes of high default and foreclosure rates, not simply because they often required voluntary cooperation from lenders, but because of the structure of many of the loans that had been originated to borrowers. At the same time, the continued fundamental weaknesses within the economy overall have clearly exacerbated the problem. The focus of this inquiry is to examine the impact in the New York City metropolitan area with a particular focus on continued high unemployment in areas with the highest rates of ongoing foreclosure, declining or stagnant home prices, the sluggish pace of the economic recovery and job creation, and the probable growth of structural unemployment as a result of the prolonged economic slump.

We also consider the role that discriminatory lending practices contributing to Black and Latino borrowers' greater likelihood of receiving 'high cost' (subprime) loans by including measures of loan/value ratios using FHFA home price indices, home price index averages, and the number of commercial banks at the census tract level, as well as an identification of lenders by type (conventional or subprime). In a

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separate paper (Doviak and MacDonald, 2011), we do find strong evidence of discriminatory lending, which confirms the findings of other studies. This same earlier investigation found that Blacks and Latinos received a disproportionately high share of pre-foreclosure filing notices, which appeared to confirm the presence of disparities in lending practices.

#### DATA: BACKGROUND

In December 2009, the State of New York enacted new legislation requiring all mortgage servicers to send all delinquent borrowers a "pre-foreclosure filing notice" (PFF) at least 90 days prior to formally filing for foreclosure on a primary residence in the state. The notice informs homeowners that their loan is in default, indicates the dollar amount necessary to cure the default and suggests measures that borrowers can take to avoid foreclosure, including negotiating a loan modification with their lender and/or consulting with a non-profit housing counselor (NYS DFS, 2009).

Beginning in February, 2010, mortgage servicers in New York State were also required to file the notices with the NYS Department of Financial Services, which collected an extraordinary level of detail on both the borrowers and the loans. The numerous data fields collected included property address, the names of the borrowers, the current monthly payment, the delinquent contractual payments, the interest rate being paid, whether the loan was a fixed-rate or adjustable-rate mortgage, the date and the amount of the original loan, the lien type, the loan term, whether the loan had been modified or not and whether an investor's approval was necessary to modify the loan. If the loan progresses to a lis pendens filing, (i.e. the first step in the foreclosure process – the filing of the complaint) then servicers are also required to follow up on their initial filing with information on the entity filing for foreclosure.

We will utilize this pre-foreclosure filing data in this current proposed inquiry to examine several factors that may or may not have contributed to the ongoing crisis. This dataset will enable us to examine each of the regions of the state separately with respect to foreclosure activity and to examine the relationship to home price indices, unemployment rates, and rates of job creation, access to traditional lending institutions, as well as the characteristics of the loans themselves.

#### **OVERIVEW OF MODIFICATION PROGRAMS SINCE 2008**

The sharp rise in, and continued high rates of unemployment since the onset of the recession in 2008 is clearly tied to the continued high rates of default and foreclosure. At the same time, falling or stagnant home prices and negative equity are seen as key factors in the unprecedented high foreclosure rates of the past five years. While many modification programs aimed initially at getting borrowers out of 'high cost' or subprime loans, many subsequent efforts have fallen short of large scale remediation of high risk loans, precisely because of issues related to the sluggish economic recovery.

According to Core Logic, an estimated 10.8 million, or 22.3 percent of all residential properties with a mortgage, were in a negative equity position at the end of second quarter 2012. Declining home values or

increased mortgage debt or some combination of these contributes to the problem (Core Logic, September 2012).

At the federal level, a number of foreclosure prevention measures have been introduced over the last few years, including the Home Affordable Modification Program (HAMP), Making Home Affordable, FHA's Hope for Homeowners Program, the FHA's refinance program for underwater mortgages, and finally the Home Affordable Refinance Program (HARP).

In February 2009, the U.S. Treasury Department allocated \$50 M in TARP funds to help homeowners struggling with their mortgages. As of May 2012, out of 1,883,740 trial modifications initiated, more than 1 million had resulted in a permanent modification (U.S. Department of the Treasury, 2012).

Further, as part of the nationwide mortgage settlement reached between the U.S. government and the lenders in 2012, the nation's five largest banks agreed to pay a total of \$25 billion to borrowers who have lost their homes to foreclosure, and to the states and the federal government to settle investigations linking the country's five largest mortgage servicers to the practice of routinely signing foreclosure related documents without the presence of a notary public and without confirming whether the facts contained in the documents were correct. Of this, a total of \$1.5 billion is to be distributed directly to homeowners who have lost their homes to foreclosure, while the nation's five largest servicers will be required to work off up to \$17 billion in principal reduction and other forms of loan modification relief for distressed borrowers nationwide (National Mortgage Settlement, 2012). In New York State, which received a total of \$107.6 million, \$9 M has reportedly gone to foreclosure prevention programs, while \$6 million in grants has been allocated to non-profits working on housing and community renewal. An additional \$25 M is slated to settle claims by New York State Attorney General Eric Schneiderman regarding [banks'] use of a private national mortgage electronic system (New York State Mortgage Settlement, 2012).

In October 2011, the Federal Housing Finance Agency (FHFA), Fannie Mae, and Freddie Mac improved upon the existing Home Affordable Refinance Program making it easier for lenders to refinance HARP-eligible mortgages by making refinancing possible for borrowers who owed more on their mortgages than their homes were worth (Fannie Mae, 2012).

Since 2007, an estimated 5.66 million homeowners have received a mortgage modification; 4.62 million received a 'proprietary' modification, while just over 1 million had received a modification through HAMP U.S. Department of the Treasury, May 2012). As of May 2012, New York State ranked second nationally in permanent HAMP modifications at 58,200.

Despite the relative success of these modification programs, many problems continue to pose obstacles to what should be a straightforward process. More than 4 million homes have been lost to foreclosure since 2007 (CNN Money, January 12, 2012).

According to the State Foreclosure Prevention Working Group (Aug. 2010), which analyzed a longitudinal dataset of nine loan servicers, modifications that included significant reductions in principal balance tended to have lower re-default rates than their counterparts. This finding led the group to recommend reducing principal balances on loans in areas impacted by significant home price declines

(Aug. 2010). Similarly, Querci and Ding (2009) found that borrowers were less likely to re-default on their home mortgage when their monthly payments were reduced through a balance-reducing loan modification. Using data from a large sample of recently modified subprime loans, the authors looked at the question of why some loan modifications were more likely to re-default than others. At the same time, they examined the characteristics of modifications that were more likely to re-default within a short term period. Their findings confirmed that modifications that involved a significant reduction in mortgage payments tended to result in more sustainable short-term modifications, and that re-default rates are further reduced when payment reductions also include a reduction in principal balances.

Such modifications have, however, been rare. Modifications with a significant reduction in principal balance represent just 20 percent of the loan modifications that the SFPWG studied. In most modifications, the loan amount increased as service charges and late payments were rolled into the loan.

With the onset of the financial crisis in late 2008, the SFPWG concluded that a comprehensive approach to loan modification was necessary. At the time its fourth report was issued in January 2010, it was estimated that just four out of ten seriously delinquent borrowers were on track for any kind of loan modification. The authors also conclude that while the HAMP program increased the percentage of borrowers participating in some form of loan modification, the rapidly rising number of such delinquent borrowers has meant that HAMP has merely been able to slow the foreclosure crisis, and that its efforts have not been able to keep pace with the rising scale of delinquencies (SFPWG, Jan. 2010).

The Home Affordable Refinance Program, initiated in early 2009, has perhaps had the greatest level of success. While the program does not involve modifications that reduce principal balances, it has had a comparatively higher degree of success in modifying underwater mortgages. Since its inception, the program, which allows homeowners in negative equity to borrow up to 125 percent of their home's equity to refinance, an estimated 1.5 million underwater homeowners have been able to refinance into a low fixed-rate 30 year loan. The program has reportedly had its biggest impact in the states hit hardest by the housing collapse and recession, including California, Nevada, Arizona and Florida (The Success of HARP 2.0, Aug. 2012).

While all of these programs have experienced some degree of success over the past three years, they have relied upon the voluntary participation of lenders and servicers, employing a number of incentives to encourage participants to modify the loans of homeowners at risk of default and foreclosure.

Thus, while the success of the various modification efforts has improved most recently, the results continue to be mixed, with significant percentages of modified loans (particularly under HAMP) going back into default.

Among the most significant of impediments to refinancing has been the large number of home loans with second liens (Been, et. al., 2011, Lee, et. al. 2012, LaCour-Little, 2009).

This paper seeks to examine the factors that are the best predictors of the probability of foreclosure. Although the problem is not new, it continues to have a significant impact on the progress of economic recovery. The most recent RealtyTrac report (August 2012) showed that one in 681 housing units in the U.S. received a foreclosure filing notice in August 2012. The report indicated that an estimated 153,500 properties nationwide during the same month received a foreclosure filing, default notice or were subject to a bank repossession and that a total of twenty states showed an increase in foreclosure fling activity. Further, according to the report, "twenty states registered year-over-year increases in foreclosure activity, led by judicial foreclosure states such as New Jersey, New York, Maryland, Illinois and Pennsylvania" (RealtyTrac, Sept. 2012).

Given the continued significance of the foreclosure issue overall (and in New York in particular, which has been the focus of our research), combined with the mixed success rates of the various modification programs in place since 2009, we seek to examine more closely a number of variables in addition to the financial characteristics of loans. These include measures of labor market conditions, specifically, unemployment rate trends, and job growth in New York regions since December 2007. Home Price Indices are also examined as a potential predictor of foreclosure, given the strong correlation between sharp home price declines in areas with elevated numbers of underwater mortgages. Also considered is the significance of the geographic location of traditional lending institutions to rates of foreclosure. It is expected that the greater the use of (and access to) traditional lenders (commercial banks, savings banks, credit unions), the lower the probability of default and foreclosure, and the greater the use of non-traditional lenders (i.e., sub-prime lenders) the greater the probability of default and foreclosure. Also examined is the number of mortgages that received a permanent modification. In addition we look at the extent to which a loan is 'underwater' as a predictor of progression toward a foreclosure filing.

#### **REVIEW OF THE LITERATURE**

A review of the extensive literature on the major factors that led to the foreclosure crisis and that have continued to reinforce its effects, lend support for the view that continued high unemployment, particularly in the hardest hit markets, the negative equity position of many borrowers, stagnant and/or continued declines in home values weigh on housing market recovery and the difficulties posed to refinancing of mortgages with second liens. These factors also continue to play a significant role in continued elevated rates of foreclosure in many labor market areas.

A broad cross-section of the literature is largely consistent in pinpointing the crisis in the subprime mortgage market beginning in 2006 as the catalyst for much of the larger housing market collapse that followed (Gerardi et al, 2008 and 2011, Been, et. al., 2011, Rugh and Massey, 2010, Bromley, 2008, Gerardi and Willen, 2008). Other analyses identify a number of other important factors that coincided with the build-up to the collapse that were at work as well. These include deteriorating loan quality and poor underwriting standards particularly in the subprime market (Been, et. al., 2011), smaller down payments and a run-up in borrowing against home equity while home prices were still rising, coupled with declines in home price appreciation that began well before the crisis (Gerardi, et. al., 2011). At the same time, the work of the State Foreclosure Prevention Working Group, (which began analyzing a longitudinal dataset of nine large loan servicers in 2007 - long before the crisis reached its peak) and Quercia and Ding (2009)
find a significant relationship between re-default risk and the failure to reduce principal balances in loan modification efforts (SFPWG, Aug. 2010).

Much of the literature also addresses the shortcomings of the various loan modification programs introduced in the wake of the foreclosure crisis. It is noted that the Home Affordable Modification Program (HAMP) in particular, had mixed results, as the available data clearly demonstrates. Others point to the significant constraints on modification efforts posed by mortgages with a second lien. It is estimated that between 40 and 45 percent of new mortgage loans originated at the height of the housing boom (2005-2007) included a second lien or piggyback mortgage which enabled borrowers with less than a 20 percent down payment to purchase a home, particularly in high cost coastal markets and in 'bubble locations.' (Lee et al, 2012). Their research documents that both the number of and value of closed end second liens (as opposed to HELOCs) represented a relatively small percentage of originations in 1999 compared with their peak in 2006.

In the years immediately prior to the housing market collapse, increasing numbers of borrowers, particularly in the subprime segment of the market, were making very small down payments at the time of their purchases, and in many cases, zero money down. At the same time, the authors note, many borrowers who had purchased years before the onset of the crisis, had been withdrawing extraordinary amounts of equity while home prices were still rising, (Gerardi et. al. 2011). These two conditions alone would clearly pose challenges to refinancing in a down market. As the market peaked and prices began their rapid decline, large numbers of homeowners – both subprime and prime - found themselves in a negative equity position. Until HARP 2.0's recent allowance of refinancing of up to 125 percent of a home's original mortgage (2011), this problem was clearly unaddressed.

Several others point to the exponential growth in second liens as a significant impediment to refinancing. Been, et. al. (2011) point out that HAMP's success was to a significant degree constrained by the presence of a second mortgage. "Second liens significantly complicate modifications because first lien holders may lose their senior status upon modification," and thus are reluctant to agree to participate in a modification unless second lien holders agree to subordinate their liens to the newly modified mortgage. As the authors point out, few have chosen to do so. Examining a sample of zip code-level and state data, LaCour-Little et. al.(2009) found that the percentage of piggyback originations from 2001 – 2008 was positively correlated with higher foreclosure rates in subsequent years. Their findings confirm that second liens rose rapidly during the housing boom and are a major contributing factor to underwater mortgages in the face of the sharp decline of home prices after the peak. They specifically looked at whether states and zip codes with a higher proportion of piggyback loans originated during the 2001 - 2006 period were associated with increased rates of delinquency and foreclosure. Their findings pointed to evidence that second liens to subprime borrowers were significantly related to higher rates of foreclosure after 2006. The finding did not especially hold for prime second-lien borrowers (LaCour-Little, et. al., 2009). Nevertheless, given the time of their study, it may have been too early to have seen the full effects of

declining home equity, which affected large swaths of the home-owning population nationwide, as home prices continued their decline through 2010 and 2011.

The introduction of 2MP, a second-lien modification program as a complementary program to HAMP later in 2009, has to date had limited success in attracting lender participation, with just over 90,000 second lien modifications from the program's inception through July 2012 (U.S. Treasury Dept., July 2012). Continued stagnant home price appreciation continues to exacerbate the foreclosure problem and refinancing obstacles.

The drag on housing market recovery and the ongoing elevated rates of delinquency and foreclosure tied to continued high unemployment rates, and longer average duration of unemployment are also viewed as central factors. Despite the decline in unemployment rates nationally from 9.1 percent in August 2011 to 8.1 percent in August 2012, rates in all New York State metropolitan areas actually rose from August 2011 through August 2012. While much of the increase is attributed to a strong increase in labor force participation rates over the year - a combination of new entrants and previously discouraged workers becoming more optimistic about the direction of the economy- (New York State Labor Department, July, 2012), the elevated rates also indicate that these participants are not rapidly being absorbed into the workforce despite the statewide addition of 130,000 private sector jobs over this same period.

The data show the continued high rates unemployment from January 2010 through January 2011 across the New York Metropolitan area's economy from January 2010 through January 2011, the period during which the pre-foreclosure filings in New York State were beginning to be filed.

Table 1: Unemployment Rates, January 2010, January 2011					
Area	January 2012	January 2011			
New York State	9.5%	8.9%			
New York City	10.4%	9.4%			
Nassau-Suffolk	8.1%	7.8%			

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New York State Department of Labor: <u>http://labor.ny.gov/stats/laus.asp</u>

Compounding the problem is the fact that the employment to population ratio in the state has declined significantly, reflecting a similar trend nationally. In New York State, that rate has declined from 58.5 percent in January 2010 to approximately 56.8 percent in January 2011 NYS Department of Labor, March 2012). Further, New York State's average duration of unemployment stood at 26.5 weeks in 2009 Employment in New York State, March 2010).

Nationally, 54.6 percent of job seekers were unemployed 15 weeks or longer as of August 2012, while the average (mean) duration stood at 39.2 weeks, an insignificant change from 39.7 weeks in August 2011 (U.S. Department of Labor, 2012).

# **OUR PROPOSED ANALYSIS**

In an earlier paper, we examined a number of financial characteristics of home mortgages that were expected to be most strongly associated with the probability of receiving a lis pendens filing (Doviak and MacDonald, 2012). That study, "Who Enters the Foreclosure Process," revealed that with a few exceptions, our findings confirmed that the financial characteristics of home mortgages were fairly strong predictors of whether a loan progressed from default to foreclosure. The rate of progression from default to a lis pendens filing was higher among defaulted borrowers who took out larger loans, made larger monthly payments, and paid adjustable interest rates. The rate of progression from default to a lis pendens filing was also higher among borrowers who were in delinquency for a longer period of time (over 120 days). Also significant was the finding that a larger proportion of defaulted borrowers whose mortgages were modified through the HAMP program progressed to a lis pendens filing. However, these regression results also suggest that this particular difference may have been attributable to the fact that many of these borrowers received a pre-foreclosure filing notice at a later stage of delinquency.

Nevertheless, this finding is clearly consistent with the large percentage of HAMP modified loans that did not progress beyond trial modifications.

Interestingly, the regression results of that study further suggest that – after controlling for other factors – defaulted borrowers with an adjustable rate mortgage or a payment option adjustable rate mortgage did not progress to foreclosure at a significantly higher rate than defaulted borrowers with a fixed rate mortgage. However, the difference between defaulted borrowers with a fixed rate mortgage and defaulted borrowers with an interest only loan was statistically significant. Those with an interest only loan were more likely to progress to foreclosure. One possible explanation offered for this finding was that many interest only loans were structured with balloon payments wherein the interest rate generally re-set several percentage points higher after perhaps three to five years.

However, the same study may also have been affected by omitted variable bias. Clearly, the significance of factors other than the characteristics of loans and borrowers themselves played a critical part in the default and foreclosure crisis. Thus, the findings of this prior study lead us to the proposed present inquiry, which seeks to examine questions related to the financial characteristics of loans within the broader context of macroeconomic conditions, as well as access to and use of traditional lending institutions. This expanded study, employing the same PFF data set, will also include variables that measure trends in home price indices, unemployment rates, and job creation rates across the New York City metropolitan region. This inquiry will begin with an incorporation of these variables into the framework of the initial model that sought to identify key loan and borrower variables that were linked to the probability of a loan entering into foreclosure.

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# Consumer Confidence and the Labor Market in New York State Arindam Mandal<sup>\*</sup> and Joseph McCollum<sup>†</sup>

#### ABSTRACT

The paper utilizes a unique New York State consumer sentiment data set collected by Siena Research Institute (SRI) to explore its relationship with New York State labor market. We have explored their relationship both at the state level and selected Metropolitan Statistical Areas of New York State. The study found that the consumer sentiments causally correlated with the unemployment rate in New York State but not vice versa. However, there are lags in the direction of this causal relationship.

## INTRODUCTION

The purpose of this study is to explore the relationship between New York State (NYS) consumer sentiment Indices (CSI) and the state's labor market performance. The paper utilizes unique data collected by Siena College Research Institute documenting the quarterly NYS consumer confidence. The labor market variables we have considered in this study are unemployment rate, job creation, job destruction, accession, recalls and separations. Consumer sentiment is a more psychological aspect of wellbeing measured by asking respondents series of subjective questions. Both consumer sentiments and labor markets are affected by the overall state of the economy. Therefore factors that affect the labor market, may also affect consumer sentiments, hence establishing a causal relationship among these variables may not be always possible. Deciphering the nature of the relationship between consumer sentiment and labor market indicators can be tricky because of the lack of definite direction of causality. Also, the usefulness of the consumer sentiment index to forecast or explain the economy in general and consumer behavior in particular is often been challenged. In the second half of the 1950s, the Federal Reserve Board of Governors appointed a committee to evaluate the usefulness of consumer survey in anticipating consumer behavior. The broad outcome of the committee report negated the usefulness of the consumer survey (Fed, 1955). The subsequent work by Tobin (1959) and Juster (1964) strengthened the conclusion of the Board of Governor's report. From a theoretical point of view, given the rational expectations hypothesis, it can be surmised that consumer sentiment index are not supposed to have additional information if it is based on the expected macroeconomic variables. However, subsequent empirical researches have shown results which are mixed. In some cases it was shown that these indices could maintain an autonomous role in forecasting and as explanatory variables in the consumption function (see Mueller, 1963; Suits and Sparks, 1965; Fair, 1971a and 1971b; Adams and Klein, 1972); in

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others, that they could be seen as nothing more than a synthesis of macroeconomic indicators (see Friend and Adams, 1964; Adams and Green, 1965; Hymans, 1970; Juster and Wachtel, 1972a and 1972b; Shapiro, 1972; McNeil, 1974; Lovell, 1975). The prevailing opinion now seems to be that it may help predict the evolution of economic activity (see Garner, 1991; Fuhrer, 1993; Carrol *et al.*, 1994; Kumar *et al.*, 1995; Matsusaka and Sbordone, 1995; Eppright *et al.*, 1998, Bram and Ludvigson, 1998).

In this paper, our aim is to explore the relationships between consumer sentiment of New York State and the unemployment rate. In section 2, we will explore the possible theoretical justification between consumer sentiment and the labor market. Section 3 discusses the data we have used in this study. Descriptive statistics is provided in section 4 and the regression results are presented in section 5 and finally we conclude in section 6.

#### CONSUMER SENTIMENT AND UNEMPLOYMENT RATE

If we talk about labor market conditions, perhaps unemployment rate is one of the most reliable indicators of the conditions of the economy in general and labor market in particular. Consumer sentiment - the psychological measure of wellbeing of consumers - is affected by the general feeling of optimism or pessimism as perceived by an individual. Therefore periods of positive economic outcomes are typically expected to have positive effect on consumer sentiment. Similarly the labor market is also intimately linked to the general economic conditions. Therefore it may not be inappropriate to assume an intrinsic link between the unemployment rate and the consumer sentiment, but the direction of causation between these two variables may not be that obvious. Mueller (1966) found convincing evidence that awareness about unsatisfactory employment conditions may adversely affect the consumer confidence, but the causation may run other way too. Given the fact that unemployment rate is a lagging variable in business cycles, any optimistic economic news may translate into lower unemployment, only with a time lag. On the other hand it is debatable whether consumer sentiment index is a leading, lagging or coincidental variable. The debate stems from the fact that Consumer Sentiment Index measures two things - first the willingness of the consumers to make major purchases in the very near term and it is measured by Index of Current Economic Conditions and second is the Index of Consumer Expectations measures how welloff consumers personally expect to be in the future and whether they believe national business and economic conditions will improve. Since consumer confidence index includes questionnaires that measure consumer sentiment based on consumer's perception about their current state of wellbeing and also their expectation about wellbeing in near term future. Given the nature of guestions asked in consumer confidence surveys, it is highly improbable if the consumer sentiment index is a lagging variable. On the other hand consumers are unlikely to be optimistic about the future, unless and until consumers feel confident about the present. Given that unemployment rate is a lagging variable; we expect a lag relationship between unemployment rate and the consumer sentiment, where consumer sentiment can explain the nature of unemployment in future. This hypothesis is also supported by the fact

that researchers have found persistent relationship between consumption and consumer sentiment (see Katona (1975), Cote & Johnson (1998) and Eppright et.al. (1998) among others, for a summary).

Researchers have also concluded that consumer sentiment is sensitive to changes in future income and uncertainty. Given that consumption and future income are variables highly correlated with the state of the economy and hence these variables also explain unemployment rate. Since unemployment rate is a lagging variable in business cycle literature, we expect that consumer sentiment should be explaining unemployment rate and not vice versa.

# DATA DESCRIPTION

The period under study is 2002-2010. We make use of quarterly data. We have data aggregated at the New York State level and also disaggregated at the Metropolitan Statistical Areas (MSAs) level. The MSAs considered in this study are Albany, Binghamton, New York City (NYC), Rochester and Syracuse. We look at the consumer confidence index (Index of Consumer Sentiment, Index of Consumer Expectations and Index of Current Economic Conditions), as well as of labor market variables (unemployment, job creation, job destruction, accession, new hires, recall and separation). The extent of study and the frequency of data are primarily guided by the availability of the data. At MSA level, consumer confidence index data for New York State is only available at a quarterly frequency.

Each month, the Siena Research Institute (SRI) survey establishes a Consumer Confidence index number for the New York State consumers. The survey is comparable with the similar national level survey conducted by the University of Michigan's Consumer Sentiment index. The SRI survey measures current and future consumer confidence, which combined provides the overall consumer confidence. The current consumer confidence is measured by the Index of Current Economic Conditions, whereas the future consumer confidence is measured by the Index of Consumer Expectations. These two indices are combined to calculate the Index of Consumer Sentiments. SRI also produces a quarterly consumer confidence index that looks at six regions (MSAs) of New York State: Albany, Binghamton, New York City, Rochester and Syracuse. The quarterly Consumer Confidence index provides regional measures of the state's economic health.

The Index of Consumer Sentiment (ICS) is derived from the following five questions:

- "We are interested in how people are getting along financially these days. Would you say that you
  (and your family living there) are better off or worse off financially than you were a year ago?"
- **2.** "Now looking ahead--do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?"
- **3.** "Now turning to business conditions in the state as a whole--do you think that during the next twelve months we'll have good times financially, or bad times, or what?"
- 4. "Looking ahead, which would you say is more likely--that in the state as a whole we'll have continuous good times during the next five years or so, or that we will have periods of widespread unemployment or depression, or what?"

**5.** "About the big things people buy for their homes--such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or bad time for people to buy major household items?"

Time series for unemployed and employed is obtained from the Local Area Unemployment Statistics survey conducted monthly by the U.S. Bureau of Labor Statistics. The monthly data is converted into guarterly data using simple average.

# **DESCRIPTIVE STATISTICS**

The sample periods are 2001:IV – 2010:IV for both the New York State and the Metropolitan Statistical Areas. Sample periods are primarily determined by the availability of Consumer Confidence Index surveys from SRI. Data is deseasonalized using the Census Bureau's X-12-ARIMA seasonal adjustment procedure.

	Index of Consumer Sentiments (ICS)	Index of Current Economic Conditions (ICC)	Index of Consumer Expectations (ICE)	Unemployment Rate	
Mean	73.11	77.05	70.57	6.09%	
Median	77.00	80.00	72.00	5.77%	
Maximum	87.00	91.00	88.00	9.38%	
Minimum	54.00	54.00	53.00	4.09%	
Std. Dev.	9.2580	11.2841	8.4838	0.0146	
Skewness	-0.5311	-0.5742	-0.2803	0.7114	
Kurtosis	2.1715	1.9595	2.4868	2.3544	
Jarque-Bera	2.7975	3.7021	0.8905	3.7631	
Observations	<b>3</b> 7	37	37	37	

# Table 1: Descriptive Statistics – New York State

The data shows substantial variation in the unemployment rate ranging from 4.09% to 9.38%. Some of these variations are due to change in demographic factors and not necessarily because of business cycle fluctuations. The distribution of the unemployment rate does vary from area to area in the state. Fig 1shows the unemployment rate in New York State and the Metropolitan Statistical Areas under study. New York City has both relatively higher unemployment rate and volatility in unemployment rate compared to rest of the state. On the other hand Albany has typically lower unemployment rate compared to the rest of the state. The unemployment rate in rest of the state follows each other closely.





## Source: Local Area Unemployment Statistics

The sentiment indices also vary substantially cross time and geographic area. Figures 2, 3 and 4 show the behavior of the consumer sentiment indices.



Figure 2: Index of Consumer Sentiment (ICS)

Source: Siena Research Institute



Figure 3: Index of Current Economic Conditions (ICC)

Source: Siena Research Institute



Figure 4: Index of Consumer Expectations (ICE)

Source: Siena Research Institute

Among the MSAs, Albany has consistently lowest unemployment rate and highest consumer sentiments. Though unemployment rate in Binghamton following the average trend in New York State, however, it has the lowest consumer sentiments as measured by all the three indices.

# **REGRESSION RESULTS**

For regression, we have converted all the series into respective logarithmic values. The Augmented Dickey-Fuller Test and Phillips-Perron test for stationarity for unemployment rate and consumer confidence indices are shown in Table 2 and 3. All the series under study are non-stationary at level. In first difference, though all the series turned out to be stationary. Since all the series are non-stationary, first difference of log values represents percentage change.

	Stationarity	/ Test for Inde (I	ex of Consume ICS)	r Sentiments	Stationarity Test for Index of Current Economic Conditions (ICC)			Stationarity Test for Index of Consumer Expectations (ICE)				
	Le	vels	First D	ifference	Le	vels	First D	ifference	Le	vels	First D	ifference
	Augmented Dickey- Fuller test statistic	Phillips- Perron test statistic	Augmented Dickey- Fuller test statistic	Phillips- Perron test statistic	Augmented Dickey- Fuller test statistic	Phillips- Perron test statistic	Augmented Dickey- Fuller test statistic	Phillips- Perron test statistic	Augmented Dickey- Fuller test statistic	Phillips- Perron test statistic	Augmented Dickey- Fuller test statistic	Phillips- Perron test statistic
NYS	-2.3246	-0.4673	-3.7426	-3.7426	-0.3692	-0.5820	-3.8954	-3.9752	-0.1510	-0.3147	-4.4249	-3.6477
Albany	-0.9666	-0.9433	-5.3818	-5.3957	-0.9958	-0.8980	-5.1894	-5.2416	-0.8772	-0.8772	-5.8802	-5.8804
Binghamton	-0.9516	-0.9062	-5.6766	-5.6809	-0.8242	-0.7944	-5.8297	-5.8382	-0.8164	-0.8621	-6.6236	-6.6323
New York City	-0.3713	-0.3249	-4.1389	-4.1450	-0.7279	-0.5790	-4.5067	-4.6130	-0.2272	-0.2118	-4.1777	-4.1777
Rochester	-0.9146	-0.8461	-4.2465	-5.1910	-0.8307	-0.7515	-4.7975	-4.7795	-0.8010	-0.8508	-5.6520	-5.6373
Syracuse	-0.6640	-0.6051	-2.6484	-5.1871	-0.6954	-0.5334	-4.0767	-6.4471	-1.7218	-0.5917	-4.5527	-4.6334

Table 2: Stationarity Test Results for ICS, ICC and ICE

# **Table 3:** Stationarity Test Results for Unemployment Rate

	Leveis		First Diffe	erence
	Augmented Dickey- Fuller test statistic	Phillips- Perron test statistic	Augmented Dickey- Fuller test statistic	Phillips- Perron test statistic
NYS	0.0634	0.5117	-2.5662	-2.6354
Albany	0.9720	1.4743	-3.1288	-3.1646
Binghamton	0.4015	0.8444	-3.0121	-3.0905
New York City	-0.3713	-0.3249	-4.1389	-4.1450
Rochester	0.3285	0.8747	-2.8918	-2.9688
Syracuse	0.4786	0.9748	-2.7852	-2.8611

The expected causal relationship between unemployment rate and consumer confidence is examined by regressing first difference of log unemployment rate on first difference of log of consumer sentiment indices. ICS, ICC and ICE are each tested separately. Below are regression models that we have tested

# Table 4: Regression Estimates

State/MSA	Estimated Equation	α	β	AR(1)/ AR(2)	$R^2$	Adj R <sup>2</sup>	DW			
	$\Delta UR_t = \alpha + \beta \Delta ICS_{t-4} + \varepsilon_t$ [AR(1)]	0.00755 (0.328)	-0.2099 (-1.731)***	0.69239 (4.991)*	0.5878	0.5583 9	2.19313			
New York State	$\Delta UR_t = \alpha + \beta \Delta ICC_{t-4} + \varepsilon_t$ [AR(2)]	0.0051 (0.3356)	-0.4205 (-3.017)*	0.47154 (2.636)*	0.5023	0.4654 9	1.43745			
	$\Delta UR_t = \alpha + \beta \Delta ICE_{t-4} + \varepsilon_t$ [AR(2)]	0.00340 (0.1430)	-0.1675 (-1.427)***	0.7008 (5.380)*	0.5618	0.5315	2.05449			
	$\Delta UR_t = \alpha + \beta \Delta ICS_{t-4} + \varepsilon_t$ [AR(2)]	0.0149 (1.2651)	-0.1911 (-1.906)***	0.3539 (1.9619)**	0.2789	0.2246	1.4785			
Albany	$\Delta UR_t = \alpha + \beta \Delta ICC_{t-3} + \varepsilon_t$ [AR(2)]	0.01415 (1.1744)	-0.2181 (-2.315)*	0.3825 (2.1608)**	0.3185	0.2679	1.5075			
	$\Delta UR_t = \alpha + \beta \Delta ICE_{t-4} + \varepsilon_t$ [AR(2)]	0.01431 (1.1445)	-0.1838 (-2.329)*	0.4063 (2.3191)*	0.3207	0.2703	1.4232			
	$\Delta UR_t = \alpha + \beta \Delta ICS_{t-3} + \varepsilon_t$ [AR(2)]	0.0121 (0.7404)	-0.2583 (-2.185)**	0.5155 (3.1881)*	0.3758	0.3312	1.5656			
Binghamton	$\Delta UR_t = \alpha + \beta \Delta ICC_{t-3} + \varepsilon_t$ [AR(2)]	0.0126 (0.7811)	-0.2829 (-2.992)*	0.5329 (3.3157)*	0.4393	0.3993	1.7530			
	$\Delta UR_t = \alpha + \beta \Delta ICE_{t-3} + \varepsilon_t$ [AR(2)]	No significant causal relationship								
	$\Delta UR_t = \alpha + \beta \Delta ICS_{t-3} + \varepsilon_t$ [AR(2)]	0.0098 (0.670)	-0.2683 (-2.206)**	0.4639 (2.7004)**	0.3280	0.2800	1.3203			
Rochester	$\Delta UR_t = \alpha + \beta \Delta ICC_{t-4} + \varepsilon_t$ [AR(1)]	0.0089 (0.534)	-0.2431 (-1.936)*	0.5980 (3.6989)*	0.5079	0.4728	2.0867			
	$\Delta UR_t = \alpha + \beta \Delta ICE_{t-4} + \varepsilon_t$ [AR(2)]	No significant causal relationship								
	$\Delta UR_t = \alpha + \beta \Delta ICS_{t-3} + \varepsilon_t$ [AR(2)]	0.0102 (0.626)	-0.3948 (-3.397)*	0.5863 (3.8180)*	0.5175	0.4830	1.6119			
Syracuse	$\Delta UR_t = \alpha + \beta \Delta ICC_{t-3} + \varepsilon_t$ [AR(1)]	0.0145 (0.748)	-0.1671 (-2.089)**	0.6542 (4.4582)*	0.5239	0.4899	2.1742			
	$\Delta UR_t = \alpha + \beta \Delta ICE_{t-3} + \varepsilon_t$ [AR(1)]	0.0121 (0.666)	-0.1970 (-1.945)***	0.6350 (4.4979)*	0.5103	0.4765	2.3975			
	$\Delta UR_t = \alpha + \beta \Delta ICS_{t-4} + \varepsilon_t$ [AR(1)]		No si	gnificant cau	sal relation	ship				
New York City	$\Delta UR_t = \alpha + \beta \Delta ICC_{t-4} + \varepsilon_t$ [AR(2)]		No si	gnificant cau	sal relation	ship				
,	$\Delta UR_t = \alpha + \beta \Delta ICE_{t-4} + \varepsilon_t$ [AR(2)]		No si	gnificant cau	sal relation	ship				

t-statistic in parentheses. \* significant at the 1% level , \*\* significant at the 5% level, \*\*\* significant at the 10% level.

The regression results show consistent negative relationship between unemployment rate and confidence indices. The causality runs from confidence indices to unemployment rate and not vice versa. This is evident from the fact that confidence indices explain the unemployment rate with a lag of three or four depending on the region. The negative relationship between confidence indices and the unemployment rate holds for New York State and all MSAs except for New York City. It seems that other

factors play an important role in determining the employment situation in New York City than consumer confidence.

#### CONCLUSION

To our knowledge, this is the first attempt to use Siena Research Institute's New York State Consumer sentiment indices to establish its linkage with New York State labor market. The paper finds that lag consumer sentiment indices causally correlate with the unemployment rate. This was expected because unemployment rate is a lag variable in business cycle literature. Therefore change in consumer sentiments has its impact on unemployment rate typically with three or four lag. In future, we would like to incorporate other labor market indicators such as job creation, job destruction, accession, separations, and recalls and explore the relationship between these variables and the consumer confidence index.

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# Economic Ideology and Deficit Reduction Choices: An Exercise to Engage Students in an Economics Principles Course

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### ABSTRACT

We introduce an exercise in which a student enrolled in principles of economics completes an economic ideology survey, makes choices from "*The New York Times* Deficit Reduction Project," reflects upon these ideology measure and choices, and records self-interest for debt and deficit reduction. Economic ideology is defined as "a view of the world that influences what one considers important." Of students completing rather than submitting a partial assignment, the difference in reported self-interest for debt and deficit reduction is significantly different. The conclusion we draw is students completing the assignment are more engaged. JEL codes: A13, A22, E60.

# INTRODUCTION

In this paper, we introduce an assignment for students in economics principles to pair the *The New York Times* deficit reduction project (Leonhardt 2010b, Leonhardt and Marsh 2010), with an ideology measurement instrument developed by Hadsell, McAvoy and McGovern (2010, 2012). Leonhardt (2010c) notes that respondents' long term choices to reduce the deficit likely reveal their ideological preferences:

But when it came to tax cuts for incomes above \$250,000, people's opinions appeared to diverge according to their political views. Those who preferred spending cuts – a conservative group in all likelihood – generally wanted this tax cut to remain in place. Among those who closed the deficit mostly with tax increases – probably a liberal group – the expiration was the single most selected policy.

Leonhardt does not measure ideology nor does the project request ideological or partisan views. While ideology may be observed in responses by Times readers, students will more concisely observe how their ideology scores are correlated with their choices by completing the assignment described in this paper. Having students to complete the survey, make successful deficit reduction choices, and reflect upon their ideology scores and choices will increase their level of engagement.

Hadsell, McAvoy and McGovern (2012) define economic ideology as "a view of the world that influences what one considers important," and this view affects behavioral modeling and policy positions. To measure ideology, they develop a survey instrument that measures economic ideology along a continuum. An undergraduate student often thinks of herself as an adherent of one particular ideology or another. Yet, undergraduate economics courses generally focus on perfectly competitive markets and

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prices to determine the best outcomes. Commonly, these courses fail to discuss alternative ideologies in a substantive manner. In this assignment, the survey instrument employs positive economic statements to measure a student's ideology. The instructor may begin a discussion of economic ideology and the survey provides a means for classroom engagement in economic ideology and the choices people (and entire economies) make. This exercise increases student interest in the course and encourages them to master economic principles.

This assignment provides a means to enhance student learning for the budget, deficits, and economic policy. At the time of this study, spring 2012, decision makers face increased uncertainty about economics policies due to election year campaigning. Additional sources of uncertainty are the potential automatic tax increases and spending cuts beginning January 1, 2013, the so-called fiscal cliff, which could have reduced GDP an estimated 3.6 percent (Rampell 2012). While the President and Congress eventually negotiated an agreement to avoid the automatic tax increases and spending cuts, uncertainty continues regarding the authorized debt ceiling as well as the ongoing need to authorize spending through sequestration. In this paper, the ideology instrument scores are correlated to respondents' choices to reduce the long term deficit. The results of the deficit reduction project help validate the ideological survey instrument.

# THE ASSIGNMENT

The assignment is presented in Appendix A. First, students are required to complete "The New York Times Deficit Reduction Project," In The New York Times Economic Scene column, David Leonhardt (2010b) analyzes the federal budget and asks his readers to make choices to reduce the 2030 federal budget deficit to no more than 3 percent of output, requiring both tax increases and spending cuts summing to \$1.345 trillion, then post them online (Leonhardt and Marsh 2010). As an exercise, these choices illustrate the difficultly of reducing the deficit no matter one's political ideology. Leonhardt focuses on the long-term deficit to force the reader to realize the enormity of the task. Leonhardt (2010a) utilizes a deficit of 3 percent because it is sustainable: one year's deficit may be paid for by economic growth the following year. Furthermore, as Leonhardt (2010b) notes, neither spending cuts nor revenue increases alone will balance the long term budget. Both are necessary. Students make choices which may be favored specifically by adherents to one economic ideology or another. Spending cuts in social programs are difficult for Democratic liberals to accept, while tax increases are similarly unappealing to Republican conservatives. Table 1 shows a summary of the possible reduction choices. The spending options total \$1.81 trillion and the revenue options total \$1.955 trillion. Due to instructions within categories, the maximum spending cut a reader could choose is \$1,590 billion, and the maximum tax increase is \$1,625 billion. Completing the survey, the student compares her score along the very liberal to very conservative continuum. When combined with the deficit reduction project, she gains a deeper understanding why she prefers one deficit reduction option as opposed to another.

Then, Students complete the ideology survey, provided in Appendix B. Using a seven-level Likerttype scale, a student records her strength of agreement (towards score 6) or disagreement (towards score 0) with 12 short statements. We use the positive economic statements which are shown to be internally consistent with the respondent's stated ideology when measuring the Cronbach's alpha score (Hadsell, McAvoy, and McGovern, 2012). The ideology score for a person is the sum of her answers to the statements (see note to Table 4). The larger (smaller) her score, she is more conservative (liberal).

Table 1. Spending and Tax Options from the New York Times Dencit Reduction Project						
Spending Options	Billions	Revenue Options	Billions			
Domestic Programs and Foreign Aid	\$160	Estate Tax	\$170			
Military	505	Investment Taxes	70			
Health Care	680	Income and Employer Taxes	715			
Social Security	465	Tax Reform	545			
		Other New Taxes	455			
Total	\$1,810	Total	\$1,955			

Table 1: Spending and Tax Option	s from The New York 7	<i>Times</i> Deficit Reduction Project
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### SUMMARY OF SAMPLE AND IDEOLOGY SURVEY

SUNY Oneonta offers Principles of Economics, ECON 110, a General Education 2000 Social Sciences course option for students not declaring the Accounting, Business Economics or Economics majors. SUNY Oneonta is a comprehensive college located in rural upstate New York, enrolls approximately 6,000 students who are largely from New York State and draws heavily from the metropolitan areas of New York City and Albany, the state capital. These students' scores and views are of interest as this is the introductory economics course for students outside the Division of Economics and Business. Approximately 120 to 180 students enroll in this course each semester.

The assignment was a portion of the course's required work. It was assigned mid-semester and due during the final week of regular class. It provided a means for the instructor to introduce the topics of budgets and economic policy and to engage students to apply their social preferences to an important economic issue. At the time of this assignment, President Obama established withdrawal or draw down dates for troops serving in Iraq and Afghanistan, thus one of the deficit reduction options had become known and likely influenced some students' choices.

For the work submitted, 138 students submitted an assignment, 115 students completed the deficit reduction choices, 118 students completed the survey, 99 students completed both the choices and the survey, and 90 students completed the survey and achieved the maximum 3 percent deficit in the expected 2030 budget. This assignment was required work for successful completion of this course, with its grade score a weight of 5 percent of the final grade. Of these 90 students, most of the principles students have completed an high school economics course, are taking their first college level economics course, are female, and most are first or second year status.1 Table 2 shows their self-reported ideology trends liberal (the median is moderately liberal), with 16 students self-identifying as moderately conservative and nine students conservative. Of students submitting an assignment, 22 of 138 declined

to report their ideology score, and of those you completed the assignment, 2 of 90 did not report their ideology score.

For the 90 students who submitted a complete assignment and provided their characteristics, additional summary measures for the self-reported ideology and measured survey scores are provided in Table 3. In the course, 73 percent are female, and 27 percent are male. The average ideology score is 28.54, below the midpoint of 36. The average self-identified ideology score is 2.77, between moderately liberal (2) and neither liberal nor conservative (3). The 90 students who submitted a complete assignment are not substantially different than those contained in the other groups.2

Tuble 2. Respendent enaluetenstics		
	All students	Completed survey, deficit choices, and achieved 3 percent reduction
Number respondents	138	90
Self-rated ideology		
Not available	22	2
Very Liberal	2	1
Liberal	17	14
Moderately Liberal	32	23
Neither	33	25
Moderately Conservative	22	16
Conservative	10	9
Very Conservative	0	0

## Table 2: Respondent Characteristics

Hadsell, McAvoy and McGovern (2010, 2012) note their survey measurement accurately measures economic ideology. The instrument is intended to spark interest in economic principles and understand better the role values play in modeling the behavior observed in the world and the resultant policies favored. In this study, the correlation coefficient between self-reported ideology and the ideology score is 0.5346 with a p-value of less than 1 percent. Therefore, the self-reported score and the survey score are significantly correlated, a lower (higher) self-reported score is associated with lower (higher) survey score. A student who reports she is liberal (conservative) is positively associated with a liberal (conservative) measurement from the survey.

# **RESULTS: IDEOLOGY SCORES, DEFICIT REDUCTION CHOICES AND STUDENT ENGAGEMENT**

Given Leonhardt's predictions, liberal (conservative) students should prefer more (fewer) tax increases and fewer (more) spending cuts, on average. For The New York Times deficit reduction choices of the 90 students who accomplished no more than a 3 percent long-term budget deficit, the students had to submit at least \$1,345 billion as tax increases and spending cuts.3 On average, they reduced the deficit by a larger average amount, \$1,550.87 billion, of which \$917.83 billion (59.2 percent of selected options) represent spending reductions, and \$633.04 billion tax revenue increases (40.8 percent). Spending cuts represented 57.7 percent of the total cuts possible and tax increases 39.0 percent. The ideologically measured and self-identified economic liberal leaning principles' students were more willing

to reduce the deficit via spending cuts rather than increase taxes. However, the correlation coefficient between the ideology score and total deficit reduction chosen is 0.2656 which is statistically significant at the 5 percent level. A conservative (liberal) leaning score is associated with more (less) deficit reduction. The coefficient indicates that economic ideology is related to the amount of deficit reduction.

economic ideology survey and reduced the long-term deficit to no more than 3 percent of GDP								
Grouping	Number	Mean	Standard Deviation	Minimum	Maximum			
Sample								
Students completing survey	115	28.39	9.11	2	53			
Students completing assignment	90	28.54	9.59	2	53			
Gender								
Female	65	28.28	9.24	2	50			
Male	24	29.71	10.58	7	53			
Self- Rated Ideology								
Very Liberal	1	2						
Liberal	14	23.29	9.06	7	34			
Moderately Liberal	23	27.09	7.89	12	47			
Neither	25	26.52	6.72	13	43			
Moderately Conservative	16	35.38	7.71	21	50			
Conservative	9	38.78	9.32	26	53			
Verv Conservative	0							

**Table 3**: Values on Scale, for students who responded to the grouping indicated and who completed the economic ideology survey and reduced the long-term deficit to no more than 3 percent of GDP

Note: See Appendix B for the survey. The larger (smaller) the score, the more conservative (liberal) is the person.

To discuss budgets and deficit reduction, an instructor may tabulate the proportion of students selecting the specific choices. Then, the instructor may correlate the ideology scores with the specific spending cuts and tax increases to show how economic ideology affects preferences for government spending and taxation.

For instance, for the sample of 90 students, 83 percent prefer to reduce the size of the military, 71 percent cut foreign aid, 68 percent reduced the nuclear arsenal, and a majority reform both Medicare and Social Security by increasing the age of eligibility to at least 68 years. Reviewing statistically significant correlation coefficients of spending options and ideology score, reducing foreign aid, the federal workforce, aid to states, noncombatant military compensation, raising Medicare eligibility to 68, and increasing Social Security retirement age to 68 are all positive at least at the 10 percent level. These options are favored by students with larger (trending less liberal / more conservative) scores. Increasing Social Security benefits to upper income earners has a negative correlation at least at the 5 percent level, and is favored more by students with lower (trending more liberal / less conservative) ideology scores. Overall, the correlation coefficient for economic ideology and spending cuts is estimated to be 0.1845 with statistical significance at least at the 10 percent level, indicating spending cuts are weakly associated with

more conservative / less liberal ideology scores, an expected result. In regards to tax increases, at least 50 percent of the students in the sample want the surtax on incomes above \$1 million. More conservative / less liberal scores are significantly associated at the 5 percent level with an estate tax that exempts the first \$5 million from tax and a lower 36 percent tax rate. More liberal / less conservative ideology scores are significantly associated at the 5 percent level with an estate tax with \$1 million exemption and a higher tax rate, higher tax rates on capital gains, a surtax on incomes exceeding \$1 million, and a carbon tax; these scores are weakly associated at least at the 10 percent level with a bank tax. Summing all tax increases, the correlation coefficient is 0.2582 and statistically significant at least at the 5 percent level, and indicates less liberal / more conservative scores are associated with the total size of tax increases, a surprising result.

Sample	(1)	(2)	(3)	(4)	(5)
Mean	3.89	3.946	3.97	4.03	4.06
Standard Deviation	1.21	1.17	1.13	1.09	1.11
Maximum	6	6	6	6	6
Minimum	0	0	1	1	1
Median	4	4	4	4	4
Number in sample	138	115	118	99	90
Number students with interest scores	113	101	98	87	81
Proportion students with scores	81.88%	87.83%	83.05%	87.88%	90.00%
Incomplete Assignments					
Mean		3.42	3.33	3.42	3.47
Standard Deviation		1.21	1.54	1.47	1.34
Maximum		5	5	5	5
Minimum		1	0	0	0
Median		3.5	4	4	4
Cumulative number students removed		23	20	39	48
Number students removed with interest scores		12	15	26	32
Proportion removed students with scores		52.17%	75.00%	66.67%	66.67%
Difference in Means Test Self-Reported Person	al Interest				
p-value		0.2450	0.1414	0.0605	0.0333

Note: Students are requested to respond to, "The problem of government budget deficits and debt is one that is of personal interest to me (be honest, this will not be graded). Choose one \_\_\_\_\_\_\_. A - Strongly disagree; B – Disagree; C - Somewhat (slightly) disagree; D - Neither disagree nor agree; E - Somewhat (slightly) agree; F – Agree; G -Strongly agree." When recording the scores, A through G is valued 0 through 6. Column (1) is the entire student sample; (2) Students from (1) who completed the survey; (3) Students from (1) who completed the deficit reduction project; (4) Students from (2) who completed the deficit reduction project; and (5) Students from (4) who achieved at least 3% long-run deficit reduction.

The respondents on average reveal themselves to be slightly conservative in Leonhardt's view, given their preferences for spending cuts. This study more precisely finds that more conservative respondents prefer more spending cuts and larger tax increases. Respondents in general chose to increase the age of eligibility for Medicare and Social Security which may not be a liberal position, yet very good actuarial reasons support the selection of these options. Furthermore, in reducing spending, our respondents very much prefer to target the military for spending cuts, a common liberal preference.

Table 4 shows evidence that the students who complete the assignment are more engaged. Students are asked to respond to the following statement, "The problem of government budget deficits and debt is one that is of personal interest to me (be honest, this will not be graded)," on a scale with seven points between, "Strongly Disagree," and, "Strongly Agree." Some important observations may be observed. First, students are more likely to report their personal interest in deficits and debt the more complete their assignment. 81.88 percent of students who submitted assignments recorded personal interest scores and proportion increased to 90 percent for those students completing the assignment as directed. Second, students completing the assignment report they "Somewhat (slightly) agree," on average with the above statement. Students who do not complete their assignments show they, "Neither disagree nor agree," on average. Furthermore, Table 4 (column 5) shows the difference in means test between the average personal interest scores for students completing the assignment and those who do not is statistically significant at the 5 percent level. The evidence is that completing the assignment and personal interest in deficits and debt are related. One possibility for this result is that a student who is already interested in debt and deficit reduction will complete the assignment. Many principles students often do not understand what are debt and government deficits. A student might have thought the work uninteresting and stopped, or the student could have thought the assignment tedious and stopped. The second panel of Table 4 shows that average self-interest does not change much between categories of students who do not complete the economic ideology survey, or the choices for deficit reduction, or both. As this question is the fourth of four steps to complete the assignment, students will have reflected upon economic ideology and deficit reduction prior to addressing the question. Students who successfully complete this assignment are more engaged.

### CONCLUSIONS

This assignment collects more precise information than Leonhardt (2010d) to connect economic ideology with the deficit reduction choices. Respondents are likely to observe that low scores are correlated with views for behavior, models, and policies very differently than correlations for high scores. These differences should foster discussion, promote deeper understanding, and allow for critical thinking. Respondents' ideology scores are linked to their choices for various budget reduction options. In this study, among 90 students, higher scores have an association with larger total tax increases and total deficit reduction. When correlating ideology scores to deficit reduction, more spending cuts are chosen by more conservative respondents, as expected; but, more tax increases are selected by more conservative students, as well. Most importantly, students completing the assignment according to the instructions are shown to have greater interest in government budgets than those students who do not complete the

assignment. The goal of student engagement is better achieved when the students complete the assignment.

The assignment in Appendix A, the ideology survey and The New York Times deficit reduction project, are a valuable exercise to link each student's self-identified ideology to her ideology score, and in turn to her deficit reduction choices. When matching the survey results to the options selected by these students, the instructor may discuss ideology, partisan views, and economic models with their assumptions. In combination, the exercise and the instruction provides an instructor with an opportunity to increase in-class participation and interest for an important current issue. The need to improve the government's fiscal position is likely to remain a contentious current issue: entitlement spending continues to increase, and Congress continues to rely upon sequestration to cut spending. Once policy makers achieve a negotiated outcome, this assignment is likely to continue to be relevant as an explanatory tool. The ideology survey and The New York Times deficit reduction project offer students a chance to gain a greater understanding of themselves and the world around them.

# **ENDNOTES**

- 1. The complete table summarizing respondent characteristics is available from McAvoy upon request.
- 2. Survey average scores and standard deviations for each question are available upon request.
- 3. Summaries for the spending reduction choices and tax increase choices are available upon request.

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# **APPENDIX A**

Instructions for completing the short paper on the federal government budget deficit. Due date on the course syllabus. This project will require some preparation (steps 1 and 2 below) and a few hours of writing (step 3). The overarching goal is for you to become more aware of the choices facing policy makers as they struggle to balance the federal budget.

## STEP 1 - Background

a. Read background chapters in the textbook (on the Macroeconomy, Fiscal Policy and Government Budgets) – this is the normal course reading, as listed in the course schedule.

b. Read the Article by David Leonhardt, "Economic Scene: O.K., You Fix the Budget," in the November 13, 2010, *The New York Times*. Available at http://www.nytimes.com/2010/11/14/weekinreview /14leonhardt.html?\_r=1&scp=1&sq=fix%20the%20budget&st=cse

From the article: "Rather than making recommendations, we are laying out a menu of major options, so that readers can come up with their own plan. The ultimate goal is to help you judge the deficit proposals that are now emerging."

## STEP 2 – Balance the budget

Click on the Multimedia Interactive Feature link (left hand side, near top of page one). This exercise requires that you make spending cuts and/or tax increases to reduce the deficit to 0 by 2015 and 2030. It is rather simplified (allowing only yes/no responses for each category) but it is a valuable illustration of the difficulties inherent in the process currently underway on Capitol Hill.

# STEP 3 - Write

Write a memo (a maximum of 3 pages of text; put tables, graphs, and references other than the sources provided here in an appendix).

a. Explain the deficit problem, both short-term and long-term. Discuss the magnitude, causes, and consequences.

b. Describe your solution to balance the budget.

i. General overview - how much spending reduction, how much tax increases.

ii. Some specifics – which programs were cut, which taxes were increased.

c. Explain the economic impacts on the macroeconomy.

i. Based on your economic training from the text and class.

ii. Short- and long-term.

STEP 4 – Some additional information

The problem of government budget deficits and debt is one that is of personal interest to me. Choose one \_\_\_\_\_

- A Strongly disagree
- B Disagree
- C Somewhat (slightly) disagree
- D Neither disagree nor agree
- E Somewhat (slightly) agree
- F Agree
- G -Strongly agree

Complete the economic ideology survey (already on the course website).

# **APPENDIX B**

DIRECTIONS: Please read each statement carefully, and indicate how strongly you agree or disagree with each item using the following rating scale:

- A. Strongly disagree
- B. Disagree
- C. Somewhat (slightly) disagree
- D. Neither disagree nor agree
- E. Somewhat (slightly) agree
- F. Agree
- G. Strongly agree
- 1. If people are poor it is mostly because of their own actions.
- 2. Regulating the price of pharmaceuticals so that everyone who needs the drugs can afford them will cause more harm than good.
- 3. Government is needed to help the less fortunate.
- 4. At birth, everyone has an equal opportunity to become rich.
- 5. If left to itself, the economy will ensure that everyone who wants a job will find one at the market wage rate.
- 6. People with very high incomes are deserving of their income and should not be forced to

share it with those who have less.

- 7. Unethical or unscrupulous businesses will eventually be driven from the market place.
- 8. Women and minorities face significant discrimination in the labor market.
- 9. Health care is a fundamental good whose provision should not be left to the market place where if you don't have money to pay for it you don't get it.
- 10. The government should provide basic housing to those unable to pay market price rent.
- 11. Businesses will develop the correct amount of environmentally sustainable ("green") technology required by society.
- 12. Competition ensures that workers are paid what they deserve.

For the following use the response scale provided with each statement.

13. How many economics courses did you complete in high school?

A. 0 B. 1 C. 2 D. 3 E. 4 or more

14. How many economics courses have you completed in college (not counting this semester)?

# A. 0 B. 1 C. 2 D. 3 E. 4 or more

- 15. Class year (right now)
  - A. Freshman B. Sophomore C. Junior D. Senior
- 16. Major
- A. Business or Business Economics
- B. Economics
- C. Accounting
- D. Other
- 17. How would you describe yourself on economic issues?
  - A. Very Liberal
  - B. Liberal
  - C. Moderately Liberal
  - D. Neither conservative nor liberal
  - E. Moderately conservative
  - F. Conservative
  - G. Very Conservative
- 18. What is your gender? A. Male

B. Female

C. Prefer not to answer

# **Economic Sanctions Exercise**

# J. Patrick Meister<sup>\*</sup>

#### ABSTRACT

This paper covers an in-class exercise in which students participate in an "international trading exercise" eventually involving economic sanctions. Students are divided into 'buying' countries and 'selling' countries. Buyers and sellers are given valuation cards and earn consumer surplus and profit, respectively. Participants learn that economic sanctions very well may not do much other than make prices somewhat higher (and quantity somewhat lower) than if no sanctions existed. Students learn economic rationale behind this insight.

# INTRODUCTION

Students have heard of one nation imposing economic sanctions on another, especially when one citizens and/or members of government of one country finds conduct of another country unacceptable. Often, students believe this is an effective way to get such a country to mend its ways.

I have developed an in-class market exercise in which students trade across nations. In the first round (or set of rounds), there are no trade restrictions. In the next round (or set of rounds), one nation bans sales to another nearby country. Students find that the sanctions do not have a strong impact on the economy of the nation subject to sanctions. Below, I present the instruction sheet given to students.

### TRADE AND SANCTIONS

There are four countries to consider: A, B, C, D

"Buyer" countries: A, B "Producer" countries: C, D

Countries A and C are very close to each other and therefore have no transportation costs (as an approximation). Countries B and D are very close to each other and therefore have no transportation costs (as an approximation).

Countries A and D are far apart, and there will be "transportation" costs of \$1 per unit.

Countries B and C are far apart, and there will be "transportation" costs of \$1 per unit.

Countries A and B are far apart, and there will be "transportation" costs of \$1 per unit

Trade and try to acquire as much "net benefit" as you can. If you are a seller, you may sell to either buyer country or the other seller country. You may also buy from any country that has any for sale and

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you may re-sell to any country. If you are a seller country, you can only receive net benefit from ultimately selling.

If you are a buyer, you may buy from either seller country or the other buyer country. You may also sell to any country that is buying. If you are a buyer, you can receive net benefit from buying (obviously). However, you can also receive net benefit by buying and re-selling.

You may advertise your offers (be they "buy" or "sell" offers) either by writing them on the board, or holding up a paper that states your "price," or by speaking out loud and trying to find a trading partner that way.

Each slip of paper I give you represents 1 unit of the product to be traded. If you make no deal, you will receive no net benefit. (If you are a producer, you will not incur any cost if you do not make a deal because you will not have to manufacture your unit. However if you do make a deal to sell, you will incur that cost.) A unit, once produced, can be traded multiple times in a given round. However, once a round is over, that unit does not store until the next round. Think of it as a "perishable" item.

Trade will be completely "free" in the first round (i.e., no artificial trade barriers like tariffs, quotas, sanctions, etc.). However, things may change in subsequent rounds!

## UNDERLYING DEMAND AND SUPPLY CURVES FOR VALUATION AND COST SLIPS

For the buyers, I hand out valuation slips (that give reservation prices). Each slip represents maximum willingness to pay for a single unit. Each slip is only used once. If a student buys a unit, s/he subtracts the price paid (which is bargained) to obtain the net gain.

For the sellers, I hand out 'cost' slips. Each slip represents the seller's (marginal) cost. If a seller bargains to sell at a certain price, the seller subtracts the cost from the price received (and this will be the seller's net gain).

I have not always given students the underlying demand and supply equations from which the buyer and seller 'slips' are generated, but I will list them here.

Demand: P = 20 - Q

Supply: P = 5 + 0.5Q

The demand equation applies to each of the two buyer countries. The supply equation applied to each of the two seller countries. Because of the transportation cost for country C to sell to country B (and for D to sell to A), trade usually has not taken place between these countries. In other words, the nations that are close to each other trade (i.e., country C sells to country A and country D sells to country B). The equilibrium price with these two equations is  $P^e = \$10$ , and  $Q^e = 10$  (both in country A and B). In the first round (or set of rounds if two rounds are used with no restrictions on trade), the average price has usually been pretty close to \$10, and the quantity has usually been 10 (or within 1 of 10).

Next, I introduce sanctions. I have told various stories in the past about why country C does not wish to sell to country A (like human rights violations in country A). Students have often laughed and teased

each other (good naturedly) about why they will not trade. However, seller country D has no such convictions and is willing to sell to any country as long as buyers are willing to pay more than their 'costs.'

What typically happens should be expected. The decrease in supply from country C to A tends to increase the price in country A, ceteris paribus. However, this will give sellers in country D incentive to sell to country A (even with the transportation cost). However, with the transportation costs, the price will tend to be higher and the quantity traded lower than when we had free trade. Then country C will sell to country B because they refuse to sell to country A. With two seller countries competing to sell in country B, the price will tend to come down and quantity up in that country relative to the case of free trade.

In fact, in the trials I have conducted, the price in country A did increase (from about \$10 to about \$11 and the quantity decreased from about 10 to 9. In country C, the price decreased (from about \$10 to \$9 - \$9.50) and quantity increased (from about 10 to 11).

# **INSIGHTS FOR STUDENTS**

Students get to experience how market forces cause change when we move from free trade to a situation where one country imposes economic sanctions on another. They find that such sanctions may only work to make prices somewhat higher and quantity somewhat lower. In other words, economic sanctions may not have a significant effect on the country that is the target. We discuss the economics behind this as above.

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# Students Evaluations: What is a Chair to Do? Preliminary Data Analysis

# William P. O'Dea<sup>\*</sup>

#### ABSTRACT

The purpose of this project is to develop a set of metrics that department chairs can use to evaluate the results of their student evaluations. In this phase of the project, I consider three issues: are the rankings of instructors stable over time; are the rankings influenced by factors beyond the control of the instructor such as the level of the class; and are the rankings influenced by the instructor's grading policy. Preliminary research indicates that the answers are respectively: yes, yes, and no. The next step in the project will be to determine whether the student evaluations can identify the qualities possessed by effective teachers.

#### I. INTRODUCTION

I am an end-user of student evaluation of instruction (SEI) data. In my role as department chair, I write letters of recommendation for faculty members requesting contract renewals, tenure or promotion. In these letters, I am expected to assess their teaching performance. We ask our faculty to provide a portfolio of material to document their teaching performance. In addition to summaries of the SEI data, this portfolio includes syllabi, copies of examinations, peer reviews based on classroom visits, and a self-evaluation. The SEI data tend to attract the lion's share of the attention in faculty discussions because they come in an easily digestible form and give at least the illusion of precision. I am also a member of my college's Promotion and Tenure Committee (P&TC). Attempts to parse the meaning of the SEI data play a significant role in our discussions of teaching effectiveness.

Ideally, we would like the SEI data to tell us something about an instructor's ability to convey a body of knowledge and train students to apply concepts developed in their courses to unstructured problems. Of course, we would also like students to retain what they learn.

At my institution, many members of the faculty are not convinced that the SEI data provide any valuable insights into a faculty member's teaching effectiveness. Some of my fellow department chairs have expressed the opinion that the SEI results are pure noise and are determined by the academic equivalent of the spin of a roulette wheel. One of my colleagues on P&TC was convinced that the SEI data did not measure teaching effectiveness but rather provided a venue in which our students could vent their racist, sexist, homophobic and xenophobic attitudes. In this vein, the Marlin/Niss Principle of Teacher evaluations is worthy of note. The Principle holds that: "Teachers who have received high student evaluations in the past

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will find them to be valuable measures of good teaching. Teachers who have received low students evaluations in the past will find them to be laughably insignificant (Marlin and Niss 1980, p. 25)".

In any assessment of the value of the SEI data, a good starting point is the literature on the subject, which is vast.<sup>1</sup> As of 1999, Becker and Watts (1999) report that "nearly 2000 studies have been conducted (p. 344)." Since 1978, over twenty articles on student evaluations have been published in the *Journal of Economic Education*. By any standards, the intellectual effort that has gone into evaluating the SEI data is impressive. The literature has three major concerns. The first is to identify the important explanatory variables that drive the SEI results. The second is to establish the relation between grading standards and student evaluations. Siegfried and Fels (1979) put the matter bluntly: "By far the most controversial issue is whether instructors can 'buy' higher evaluations by lowering the (effort) price to students of achieving a given grade (p. 931)." The third focus of the literature is to identify proper estimation techniques. While ordinary least squares (OLS) is the low-cost solution to any estimation problem, it may not be the ideal approach to employ in the analysis of SEI data. Given my role as a consumer of SEI data, I am going to focus on the first two concerns.

With regard to the question of what instructor qualities are valued by students, the literature is reassuring. Boex (2000) reports that "from the students' point of view, organization and clarity was the single most important attribute of effective economics instruction (p. 213)." Bosshardt and Watts (2001) find that students care about enthusiasm and preparation. DeCanio's (1986) results highlight the importance of organization and structure. Nelson and Lynch (1984) find "clarity of communication and instructor enthusiasm" to be the most important factors explaining favorable student evaluations (p. 21).

Concerning the impact of grades on evaluations, the results in the literature are mixed. Some authors such as DeCanio (1986) find "no evidence that the expected grade influences the instructor's teaching effectiveness score (p. 172)." Other authors find that the impact is small. For example, Nelson and Lynch (1984) report that a one point increase in the average grade in a course (on a four point scale) only raises the instructor rating by .15 (on a five point scale). McPherson (2006) finds a more pronounced effect: a one point increase in the average grade raises the teaching effectiveness score by .34.

Of course, establishing the impact of grades on the SEI ratings is not easy. Higher grades are not necessarily an indication of lax grading standards or a naked attempt to curry students favor. Higher grades could be the result of effective instruction that results in a high level of student learning. Ideally, we would like to hold the level of student learning constant in order to discover whether instructors with more lenient grading standards receive higher evaluations. The problem is that since examination design and grading are generally under the control of individual instructors it is difficult to find an independent measure of what students have learned. This is not to say that attempts have not been made. For example, Weinberg et al. (2009) use student performance in follow-up courses as a learning measure. Depressingly, their results show that "student evaluations are strongly related to grades and that learning, as measured by future grades, is unrelated to student evaluations once current grades have been controlled (p. 254). " Of course, it is also important to hold more than learning constant. Isley and Singh (2005) suggest that self-selection on

the part of students is a confounding factor. Since students know the identity of their course instructors in advance and have access to information sources such as Rate My Professor, it is possible that some instructors have developed reputations that attract hard working, highly motivated students and repel the casually dedicated. The result would be a high level of student performance that translates into high grades and high SEI ratings. Their results suggest that such a causal factor is at work.

The fact that the literature despite its bulk offers relatively few hard results is not that surprising. Student evaluation instruments are extremely heterogeneous. I have looked at thirteen instruments from other institutions. While this sample is probably not representative, a few observations are in order. The first is the instruments vary widely in length from a relatively compact ten questions at Ohio State (Weinberg et al. 2009) to the 50 question workout used at Ball State (Dilts 1980). The surveys generally cover the same basic concerns: organization and delivery of lectures; course management; examination design and grading; and classroom demeanor. Some of the surveys have "bottom line" summative questions in which the students are asked to rate the value of the course or the instructor's overall performance. For example, on our instrument, the last question asks for "an overall evaluation of teaching effectiveness." Other instruments do not. The presence of a summative question is important since by its nature this type of question tends to attract more attention than the other questions in the instrument.

Even if a uniform evaluation instrument were in use, there is no reason to expect that analysis of the data would yield equally uniform results. Institutions differ with regard to factors such as the emphasis they place on teaching versus research, whether they are populated by residents or commuters, and the age of the student body. Even at the same institution, it is likely that the SEI ratings could differ across disciplines. Becker (1997) notes that "economics is one of the disciplines that is consistently at the bottom of both course and instructor effectiveness scales... (p. 1369)."

As a department chair, I am in the position of having to make sense of the data that are generated by my department's evaluation instrument. I did not design the instrument. Owing to faculty inertia and/or risk aversion, changing the instrument would be difficult. I have no access to student level data. All I receive are the statistical summaries of the results for each course section. The lack of student level data is not necessarily a bad thing. Weinberg et al. argue that if the goal is to establish the connection between grades and teaching ratings, it is entirely appropriate to focus on class-level data. I have no independent measure of what students have learned in a course. In the literature, measures of student learning tend to be based on either a comparison of pre-and post-test results (for example, Marlin and Niss 1980) or, as noted above, an analysis of student performance in follow-up courses. I have no great interest in pursuing either approach. The first would make a sizable dent in my budget and try the patience of my faculty. The second would be difficult to implement and would represent a major addition to my workload. I have access to the distribution of grades in each course section. What I do not have access to are the courses grades (or the expected course grades) of the subset of students in each course who actually complete the questionnaires.

In short, I am the proprietor of an ongoing experiment that was not well-designed. Consequently, I have at my disposal an imperfect data set. My task is to extract the maximum possible meaning from this data, assuming that there is meaning to be extracted.

This paper represents my preliminary analysis of my data. I would like to answer three questions. First, are the data so noisy as to be essentially meaningless? Second, to what extent are the results influenced by factors beyond the control of the faculty members? In addition to the alleged antisocial tendencies attributed to our students by my colleague on P&TC, these factors could include the level of the course, the number of students enrolled in the course, and the time of day at which it is offered. Third, to what extent are the SEI results influenced by factors under the control of the faculty members such as their grading standards and course design and delivery. My ultimate objection is to develop a set of simple metrics that can be used to answer these questions and a means of adjusting the SEI results to account for factors beyond a faculty member's control.

### II. BACKGROUND AND SUMMARY DATA

At Oneonta, it is College policy that the SEI questionnaires be administered in every course every semester. Individual departments can use a College questionnaire or substitute an instrument of their own design. The Division of Economics and Business, which houses the Departments of Economics, Finance and Accounting (EFA) and Management, Marketing and Information Systems, uses its own questionnaire.

The timing and mechanics of administering the SEI instrument are up to the individual faculty member. Typically, the SEIs are administered during the last two weeks of the semester. Some brave souls administer the evaluations during the final examination period. Instructors are not supposed to administer the questionnaires. Some instructors recruit other members of the faculty to hand out and collect the forms. Other instructors explain the process, distribute the forms, and designate a student in the class to collect the forms and return them to the department office. The department secretary then types up the written comments. The forms are then sent to the Office of Institutional Research which generates summary statistics and provides analysis of the individual questions.

The questionnaire used by the Department of Economics, Finance and Accounting (EFA) is relatively compact. It asks the students to answer thirteen questions and provide their GPAs. Unlike the instruments at other institutions, we don't ask the students to provide their expected grade for the course or to rate the value of the course. Our bottom line question focuses on instructor effectiveness. On our form, one is excellent (or the equivalent) and five is poor. On the back of the form, the students can provide written comments. The student comments tend to be terse. If our students write more than a sentence or two, it is generally a sign that they are not pleased.

Table 1 provides data on the average scores for the thirteen questions for the course sections taught in EFA from the fall of 2008 to the spring of 2012. There were a total of 277 course sections taught by nineteen different instructors. In general, the scores are slightly over two which means that on the" overall evaluation

of teaching effectiveness" and most of the individual components of instructor performance our students think their instructors are (almost) very good.

It is also possible that course and instructor characteristics affect the student evaluations. Table 2 presents summary data for course and instructor characteristics that have been employed as explanatory variables in other studies. The number of students enrolled in the course captures the possibility that students might prefer smaller classes because they allow more interaction between the instructor and the students. The percentage of surviving students who complete the SEI form accounts for the possibility that the sample of students completing the SEI forms might not be representative of the entire population of students in the course. Thus, the SEI data are subject to sample selection bias. Boex (2000) raises the possibility that students who are disappointed with a course are likely to stop attending class and thus will not fill out the SEI questionnaire. The result would be a higher overall SEI rating. Becker and Watts (1999) suggest that instructors might manipulate the response rate by deciding when to administer the form. For example, at our institution, an instructor might administer the evaluation on a Friday, which is a day with a relatively high absenteeism rate. Of course, if the group of students completing the questionnaires includes the most talented and hardworking students in the course, these would be the

Business Economics and Professional Accounting students to satisfy major requirements. Presumably, some of these students would not be very disappointed if, say, intermediate microeconomic theory were dropped from the list of major requirements. The 200 and 300 level major courses are taken by economics and accounting majors and students pursuing a concentration in finance, i.e. these courses are taken by volunteers who should know what they are in for. The average of the student rating for the overall effectiveness item is 2.54 (halfway between very good and good) for all 100 course sections. For 200 level required courses, 200 level major courses and 300 level major course, the overall rating is much lower (better); the ratings are 2.17, 1.9 and 1.81 respectively. The difference between the overall rating in the 100 level sections and the upper division sections is statistically significant. The median grade for all course sections taught in EFA is a 2.85 which is in the B/ B- range. The median grade for all course sections taught in the College is in the A-/B+ range. It is important to note that the median grade is based on the entire population of students who complete a course. This population is larger than the population completing the SEI forms. Again, the issue is whether the group of students completing the form is representative. Table 2 also provides data on the gender and the nationality of the course instructor. The percentage of courses taught by senior faculty members is also shown. In order to be promoted to the ranks of associate or full professor at our College a faculty member must demonstrate outstanding proficiency in the area of teaching. (Of course, there is also the possibility that once promoted the faculty member can rest on his or her laurels.) Finally, to account for the possibility that instructors with more experience are more effective, the table provides data on the number of semesters of prior teaching experience at Oneonta. In the next step of my research, I intend to collect data on the times of day at which courses are taught, the length of the class period, the rooms in which classes are taught and include a semester dummy variable. students who are best able to evaluate an instructor's effectiveness. Table Three also contains data on the level of the course. The

introductory 100 level courses have very heavy enrollments of students who come from outside the Division of Economics and Business and are taking the course to satisfy general education requirements or a related work requirement for their majors. These students might be more interested in an easy grade than in what they learn. The 200 and 300 level courses are taken mainly by Business Economics, Economics, and Professional Accounting majors. The 200 level required courses are the intermediate economic theory courses, corporate finance, and business law, which are taken by

### Table 1: Summary Statistics Teacher Evaluation Questionnaire

Question	Mean	Standard deviation
Rigorousness of the course	2.27	.55
Organization of the Course	2.22	.67
Teaching skill is evidenced by classroom presentation	2.25	.76
How well instructional materials were coordinated with lecture	2.19	.69
Poise and self confidence	1.89	.59
Planning and clarity of examination questions, and their relevance to	2.29	.71
reading materials and classroom presentations.		
Ability to answer questions and clearly explain concepts	2.16	.73
Tolerance of attitudes and opinions of others	1.94	.61
Ability to maintain control of class discussion without getting into	2.04	.61
irrelevant matters		
Availability for consultation	1.99	.54
Maintains demanding grading practices	2.06	.45
Fairness in grading and in the implementation of his/her own announced	2.12	.5
grading procedure		
Overall evaluation of teaching effectiveness	2.26	.72

# Table 2: Summary Statistics Class and Instructor Characteristics

Variable	Mean(Proportion)	Standard deviation
Enrollment	34.26	13.91
Withdrawals	2.53	4.55
Number of SEI forms completed	23.68	9.93
Percentage of survivors completing SEI form	75.98	15.49
100 level	39.35 (109/277)	
200 level required	34.66 (96/277)	
200 level major	6.5 (18/277)	
300 level major	19.49 (54/277)	
Median grade	2.85	.43
Male	68.23 (189/277)	
Non-native	21.66 (60/277)	
Rank (Assoc., full)	29.24 (81/277)	
Semesters of teaching experience at Oneonta	11.14	10.72

# III. IS THE NOISE TO SIGNAL RATIO INFINITE?

To answer the question of the whether the data generated by the student evaluations are pure noise, I use two approaches. Of the nineteen faculty members who have taught courses in EFA over the last four years, eight have taught courses each semester. For each of these instructors, I have computed the weighted average (the weights are based on course enrollments) of the student responses to the "overall evaluation of teaching effectiveness" question. The results are shown in table 3.<sup>2</sup> The numbers in

parentheses are the rankings of the eight faculty members each semester (1= highest, 8= lowest). As a quick glance at the data in the table will confirm the SEI ratings are rather stable. For example, instructor E was the highest rated instructor each semester and instructor Q was the lowest rated. Each semester the difference between the SEI rating of the highest and lowest rated instructors is over two standard deviations, which is large. The correlations between the semester ratings are shown in table 4. The correlations between the semester ratings are generally too high to be the result of random chance. The correlations between the rankings tell the same essential story.

			i tu inting in p					
Instructor	SP 12	F11	SP 11	F 10	SP 10	F 09	SP09	F08
А	1.8(4)	2.16(4)	1.75(3)	1.88(3)	2.03 (6)	1.89 (5)	1.83(4)	2.26 (5)
D	2.75(6)	2.79(6)	2.25(5)	2.41(6)	1.83(5)	2.21(6)	2.66(7)	2.09(4)
E	1.32(1)	1.4(1)	1.34(1)	1.22(1)	1.28(1)	1.3(1)	1.2(1)	1.31(1)
I	1.68(3)	1.51(2)	1.58(2)	2.03(4)	1.82(3)	1.79(3)	1.64(2)	1.98(3)
K	1.56(2)	1.79(3)	2.3(6)	1.42(2)	1.82(3)	1.63(2)	1.81(3)	2.43(6)
Р	2.94(7)	3.1(7)	2.37(7)	3.31(7)	2.85(7)	2.61(7)	2.43(6)	2.64(7)
Q	3.03(8)	3.46(8)	3.07(8)	3.39(8)	3.33(8)	2.78(8)	2.69(8)	3.1(8)
Z	2.14(5)	2.31(5)	2.02(4)	2.13(5)	1.66(2)	1.88(4)	2.04(5)	1.86(2)

Table 3: SPI Scores	by Semester	(Ranking in	parentheses)
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 Table 4: Correlation between Semester SPI Scores

	SP 12	F11	SP 11	F 10	SP 10	F 09	SP 09	F 08	
SP 12	1								
F 11	.9712	1							
SP 11	.803	.8647	1						
F 10	.9468	.9201	.7606	1					
SP 10	.7985	.8502	.8330	.9019	1				
F 09	.9602	.9577	.8353	.9824	.9241	1			
SP 09	.9555	.9411	.8574	.8518	.7307	.9103	1		
F 08	.6985	.7739	.8921	.7604	.9229	.8376	.7389	1	

A different approach suggested by Watts and Bosshardt (cited in Isely and Sigh 2005) is to use a fixed effects model to capture instructor-related differences. The motivation is that is instructors may use different approaches to teach the same course. These differences could be difficult to measure. Instructors also differ on other hard to measure qualities such as charisma and sense of humor. Following Watts and Bosshardt, Isely and Singh and McPherson (2006), I create dummy variables for each instructor. (In this exercise, I exclude two faculty members who only taught at the college for one semester.) Using OLS, I regress the average of the student responses to the "overall evaluation of teaching effectiveness" on each on the instructor dummies. The results are presented in table 5. In general, the instructor coefficients are highly significant. For convenience, I provide the predicted instructor ratings in the last column of the table. Each instructor's ranking is shown in parentheses.
Taken together, the two approaches indicate that the instructor ratings are not particularly noisy. The differences between the instructor ratings are large and tend to persist over time. Instructors who are highly rated tend to be highly rated consistently and similarly for instructors who receive low ratings.

The fact that our SEI instrument produces consistent rankings does not mean that it is any good or that it tells us what we want to know. The ratings could be affected by forces beyond the instructor's control such as the mix of courses taught, gender or nationality. They could also be influenced by forces under the instructor's control. For example, they could be influenced by an attempt to buy good student ratings with high grades or by an attempt to manipulate the student evaluation results by picking a propitious day on which to administer the evaluation questionnaire.

Variable	Estimated	Standard Error	t-statistic	Estimated SPI
	Coefficient			Score (ranking)
Intercept	3.1177	.1189	26.2099**	
Α	-1.2568	.1711	-7.3468**	1.86 (6)
С	-1.3821	.2279	-6.0657**	1.74 (4)
D	7904	.1536	-5.1454**	2.33 (10)
E	-1.8404	.1635	-11.2538**	1.28(1)
G	0178	.1864	0957	3.09 (15)
1	-1.4204	.1536	-9.2465**	1.69 (3)
J	-1.5256	.1683	-9.066**	1.59 (2)
К	-1.3157	.1549	-8.4913**	1.8 (5)
Ν	6915	.1864	-3.702**	2.43 (11)
Р	3796	.1536	-2.4709*	2.74 (12)
Q	1735	.1549	-1.1199	2.94 (14)
U	3088	.1818	-1.6987	2.81(13)
V	8649	.1635	-5.2885**	2.26 (9)
Y	9795	.1742	-5.6231**	2.14 (7)
Z	9663	.1635	-5.7419**	2.14 (7)
AA	.0062	.2278	.0274	3.12 (16)

Table 5: OLS Regression Results with Instructor Dummy Variables

Number of observations=277

 $R^2 = .5926$  adjusted  $R^2 = .5675$  F = 23.635

\*\* significant at the 99 percent confidence level

\* significant at the 95 percent confidence level

# IV. "THE STARS ARE STACKED AGAINST ME": THE IMPACT OF FACTORS BEYOND THE INSTRUCTOR'S CONTROL

A number of the variables included in table 2 can legitimately be viewed as beyond the instructor's control: course enrollment, the level of the course, gender, nationality and years of experience at the college. I use OLS to regress the "overall evaluation of teaching effectiveness" on these explanatory variables. The results are shown in table 6. While this set of variables has less explanatory power than the fixed effects model, the results show that the variables do matter. Course enrollment has a negative impact on the student ratings. A ten student increase in class size would cause a .17 point increase (deterioration) in the overall evaluation rating. The coefficients of the course level dummies for 200 level required courses and 300 level major courses show that students in the these upper division courses give

Variable	Estimated coefficient	Standard Error	t-statistic
Constant	1.62	.2229	7.2696**
Enrollment	.0172	.0043	4.0396**
200 Required	3118	.1042	-2.9912**
200 Major	1946	.1888	-1.0309
300 major	4255	.1522	-2.7954**
Male	.3686	.0889	4.1437**
Foreign	.2541	.1177	2.1599*
Semesters at OSC	0048	.0039	-1.2275

**Table 6:** OLS Regression Results for Course and Instructor Characteristics

Number of observations=277

 $R^2 = .3181$  adjusted  $R^2 = .3003$  F = 17.9234

\*\* Significant at the 99 percent confidence level

+ Significant at the 90 percent confidence level

significantly lower (better) student ratings than do students in the 100 level introductory courses. This result confirms Dilts' (1980) finding. He found that student evaluations in required courses were .66 point worse than in courses taken by majors. The average rating for a male instructor was .37 point higher (worse) than that of a female instructor. The average rating of a foreign born instructor was .25 point higher than the rating for a native-born instructor. These differences are statistically significant. Interestingly, instructor experience as measured by semesters at the college has a negligible and statistically insignificant on the student ratings.

Of course, these results are only suggestive. For example, female instructors might receive higher ratings than their male colleagues not because of their gender but because they are more effective teachers. It is also possible that female instructors receive higher ratings because they are more lenient graders than their male colleagues. Therefore, it is important to consider the impact of factors under a faculty member's control on the SEI results.

# V. "THE FAULT LIES NOT IN THE STARS BUT IN OURSELVES": THE IMPACT OF FACTORS UNDER THE INSTRUCTOR'S CONTROL.

In any consideration of factors under the faculty member's control, the obvious place to start is with grades. If the "overall effectiveness" ratings are regressed on the median grade in each course, the coefficient of the median grade is -.59, which means that a 1 point increase in the median GPA in a course section lowers (improves) the "overall effectiveness "by .59 point. The coefficient is statistically significant. This result is suspect on a number of grounds. I'll consider one in particular. In the 100 level courses, the median grade is 2.56 (B-/C+) which is significantly lower than the median grades in 200 level required courses (2.9, B/B-), 200 level major courses (3.19, B/B+), and 300 level major courses (3.21, B/B+). These differences are easy to account for. The 100 level courses attract heavy enrollments of students from outside the Division of Economics and Business who take the course to satisfy related work requirements for their majors or general education requirements. Unlike students in the upper division classes who must earn a C or better in order to avoid repeating the class, students from outside the division taking the 100 classes only need to earn a D- to receive credit for the course. To adjust for the impact of course level on grades, I regress the overall evaluation rating on course level and median grade. These results are shown in table 7.

As is readily apparent, once we control for the level of the course, the median grade has a statistically insignificant impact on the student rating.

Variable	Estimated coefficient	Standard Error	t-statistic				
Intercept	3.0397	.2918	10.4173**				
200 Required	4383	.0974	-4.5007**				
200 Major	6397	.1761	-3.633**				
300 major	8234	.1275	-6.4596**				
Median Grade	1484	.1114	-1.3321				

Table 7: OLS Regression Results for Course Level and Median Grade

Number of observations=277

 $R^2 = .2457$  adjusted  $R^2 = .2346$  F = 22.1473

\*\* Significant at the 99 percent confidence level

+ Significant at the 90 percent confidence level

#### **VI. CONCLUDING COMMENTS**

At this stage, I can offer some preliminary answers to my three questions. First, the results of the student evaluations are not noisy. The results are stable from semester to semester. Second, the results do appear to be influenced by factors beyond the instructor's control such as the level of the course. The results do not seem to be influenced by grades. At least in my department, a policy of assigning easy grades does not appear to be winning approach to receiving high scores on the student evaluations. The results appear to be driven by what goes on in the classroom. Exactly what differentiates more effective from less effective will be explored in the next phase of the study.

#### **ENDNOTES**

- 1. A more detailed review of the literature can be found in O'Dea (2010).
- In assigning letters to identify faculty members, I did not use any letters that correspond to the first initial of a faculty member's last name. For example, no faculty member is identified by the latter O. The remaining letters were assigned to faculty members randomly.

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## Three Growth Sectors for a Restructured Greek Economy

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#### ABSTRACT

Three growth sectors are identified for a restructured Greek economy. They are: (1) higher education for foreigners; (2) retirement and long-term care of the elderly from foreign countries; (3) assembly and manufacture of small cars. The paper argues that factor availabilities provide Greece with an advantage in these sectors.

#### INTRODUCTION

A 25% unemployment rate describes the tragic state of the Greek economy. But this economic statistic is accompanied by tragedies among individuals and the society which reflect a nation which is becoming dysfunctional. Youth unemployment is above 25%. Young Greeks are abandoning their dreams of the future and looking to emigrate. Parents who have lost their jobs and their businesses are unable to help their children. Some of the parents commit suicide in despair. At schools and universities stray dogs may roam the grounds and classrooms may not have heat in the winter. Telephone service and staff may be cut. Hospitals do not have funds to purchase pharmaceuticals and supplies. In short, the fabric of society has been torn apart and what Americans take for granted in a functioning society would not be the present-day situation in Greece.

Greece is a county that is poor in natural resources. Arable land is in short supply and other natural resources that were a concomitant of the Industrial Revolution are lacking as well.

#### MODERN HISTORICAL BACKGROUND

Modern Greece endured hundreds of years of subjugation under Ottoman rule after the fall of Constantinople. Under the Ottoman Empire enterprising Greeks would travel within the Empire to Istanbul, Romania, Egypt and other areas for a better life than was available in the homeland. A few left the Ottoman Empire and went to Russia, France, and other parts of Europe and formed the nucleus of the Friendly Society (Filiki Eteria). It was a secret organization that began the Greek War of Independence in 1821. Gradually, parts of Greece achieved their independence from Ottoman rule during the 19th century and the Balkan Wars of 1912-1913. Other parts of Greece became independent at the end of World War II. Thus, the formation of modern Greece entailed many struggles and travails.

During World War II Greece was occupied by Bulgaria, Germany, and Italy. According to Richard Clogg, an emeritus fellow at Oxford, this occupation resulted in a hyperinflation that was 5,000 times more severe

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than the infamous German hyperinflation of the 1920's Weimar Republic. Price levels in Greece in January 1946 were more than five trillion times those of May 1941. The population suffered from starvation, deportations, and reprisals. The Axis troops pulled out in 1944 and destroyed schools, bridges, and buildings as they withdrew. Thus, although nominally a victor on the side of the Allies, Greece emerged from World War II in ruins. The three-year civil war with the Communists then ensued and further delayed any economic recovery.

Throughout the 20th century Greeks have been emigrating from Greece to other lands for better economic opportunities. The Greek Diaspora has sent people to the United States, Canada, Australia, South Africa, and Brazil. It has sent "guest workers" and residents to West Germany, Switzerland, England, and other parts of Europe.

The disastrous background factors of wars and poor natural resources have meant that Greece never really achieved an advanced economic state. It relied on tourism, shipping, emigrant remittances, and outside assistance as its inhabitants aspired to a high living standard which was difficult to sustain. A dysfunctional political system emerged characterized by family dynasties, cronyism, corruption, ineffective tax collection, a military coup, bureaucracy, and other failings.

#### ANECDOTES ABOUT A PATHOLOGICAL ECONOMY

On the macro level the intractable problems are well-known. There is a push for more austerity leading to lower consumption and more unemployment in a seemingly downward spiral.

Anecdotes or vignettes on the micro level are also instructive. It has been estimated that it would be cheaper to put all inter-city railroad passengers in taxicabs than run the railroad system with a padded labor force paying high salaries for the workers.

It has been estimated the public-school system employs four times as many teachers per pupil as Finland. Yet, in the past, Greek parents have assumed they needed to hire private tutors for their children in order for them to learn something.

In an English-language Greek American weekly newspaper (The National Herald), there was a report that a Diaspora Greek tried to open a water park in Greece. It took over two years to get all the 17 licenses including a visit to the dentist and a statement by the investor that he knew how to swim. He was issued a license for a fish farm since there was no existing law on how to open a water park.

Growth in income and employment are needed in Greece and an improved balance of payments. A restructured economy and Herculean political leadership are required to forestall the downward spiral. This paper suggests three areas that political and economic leadership can consider.

#### 1. PROFESSIONAL AND VOCATIONAL EDUCATION FOR FOREIGNERS

Greece should become a center of educational excellence in fields ranging from medicine and dentistry to other technical and vocational fields. The country's leadership should identify educational fields in high demand and provide the education at affordable and attractive rates for foreigners. In effect, this would constitute export-led growth by educational services. There would be revenue from tuition and fees, room and board, travel by students and relatives, and other forms of spending. Greece would need to target particular fields and tailor programs for those fields and for students from various areas of the world ranging from the Western Hemisphere, other EU countries, the Balkans, North Africa, the Middle East, and elsewhere.

At present, Greece has about 45 universities or institutions of higher learning. Seven of the universities have medical schools. There are technical institutes, some private universities, and the Athens campus of the University of Indianapolis. A high degree of leadership (central planning) may be required to achieve the objective of export-led growth by educational services.

If one targets the medical field, experts will need to consider thoughtfully many aspects that will be needed for a successful program. The prototype model can be the Caribbean medical schools of the Western Hemisphere which train doctors and obtain affiliations with U.S. hospitals. In the Greek arena some of the questions would be as follows. Should the primary language of instruction be English for the foreign students? Which Greek educators and doctors can provide instruction in English or other foreign languages? How quickly can others be retrained? One will not be seeking perfect fluency but adequate fluency. For Greek educators the choice might be between rapid retraining and unemployment.

It appears that Greek students pay no college tuition, a feature of the Constitution. But Greek universities and the faculties can be downsized either voluntarily or as they run out of funds. As we all know, universities have excess capacity. Facilities can be seized, turned over, rented or otherwise made available for new ventures. The new ventures or arrangements can include:

- Permitting and encouraging for-profit companies to enter the educational field in Greece. U.S. companies include Apollo Group, DeVry, Capella, and others. There are for-profit U.S. companies that provide training in vocational fields.
- 2. European companies that provide vocational training can also be identified and they can be encouraged to begin operations in Greece.
- 3. For-profit education companies can be started in Greece as independent Greek companies with some foreign investors or as joint ventures with foreign companies.
- 4. Associations and cooperation can be encouraged with foreign universities. They can be spurred to set up satellite campuses in Greece with a mixture of faculty and staff.

The new educational enterprises or the extensions of the old ones will need to deal with accreditation and professional certification. How do I provide professional certification for doctors in the U.S. or Canada or Libya or Romania? How do I provide certification for civil engineers? For mechanical engineers? In France? Saudi Arabia? Nigeria? Denmark? Elsewhere?

It is clear that many elements will need to be coordinated. They are: program and professional certifications; faculty and staff and their skills; students and their recruitment; facilities and resources; funding; organizational leadership.

#### 2. RETIREMENT AND LONG-TERM CARE FOR THE ELDERLY OF FOREIGN COUNTRIES

As the ranks of the elderly grow in the world, they will require retirement havens and places that can provide for their medical care in their elderly years. Canadians travel to Florida for the winter. And people from the Rust Belt retire to the Sun Belt. Greece should capitalize on its natural advantages of weather and scenery and combine them with low labor costs to provide care for the elderly in various forms. The care for the elderly ranges from independent living to assisted living to convalescent care to nursing home care. The strategy in a nutshell would be to provide services to the elderly from foreign countries.

As with the educational field, the Greek government would have to streamline and modify any regulations that constitute barriers to expansion in this sector.

From the United States there are various companies that operate in this field on a for-profit basis. They include Sunrise Senior Living, Brookdale Senior Living, Five Star Quality Care, and Capital Senior Living Corp. They and others can be invited and encouraged to expand into Greece. There should also be European companies that operate in the field.

My personal suggestion for this sector would be to tailor retirement facilities to the national origin of the retirees. Thus, an assisted living facility could have a clientele of Danish citizens with the Greek staff having some fluency in Danish or gaining it over time. Teleconferencing could be utilized to keep the retirees in contact with relatives and friends back in Denmark. The relatives and friends would be encouraged to vacation in Greece and provide tourist revenue as an additional benefit for the Greek economy. Ideally a Danish retirement haven would be located in a resort or tourist area in Greece near an airport. Similar facilities would be located in other locations for retirees from Belgium, Sweden, England, and other countries of origin. Excellent teleconferencing facilities would be available at each site.

#### 3. ASSEMBLY AND MANUFACTURE OF SMALL CARS

Greece does not have the advantage of an extensive industrial base that would give it a comparative advantage in manufacturing. But it should give some thought to the possibility of assembling and manufacturing very small cheap cars. The Tata Nano, a city-car available in India, could be a prototype. Essentially the cars would be two or four-seaters at best. The simpler versions might be viewed as covered motorcycles or motor scooters that are suitable for commuting and basic errands in a town or community. Some of the components could be imported with some fabricated locally and assembly taking place in Greece.

Where the cars do not need an extensive cruising range, they could be gasoline-powered or batterypowered. Battery powered cars might be recharged through solar energy taking advantage of the Greek climate and the power of the sun. Some models could be viewed as having export capabilities to low-income populations in Africa and the Balkans.

Greece could also consider a Zipcar rental model to economize on the expenditures for automobiles. The Greek economy is characterized by "idle hands". Thus, there should be people available to make reservations, keep track of vehicles, maintain and clean them, and recharge the batteries with solar energy if

the automobiles function that way.

Economic planners could accelerate the movement to small cars through high registration fees, high gasoline taxes, and through the ongoing austerity measures that would curtail discretionary spending. Creative organization measures might be needed to make the manufacturing ventures possible. With a huge unemployed labor force, one could offer to pay minimum wage in combination with stock options for the entire labor force to give them a stake in any success achieved by the manufacturing sector.

#### CONCLUSION

It would be nice if Hercules or some other hero emerged from Greek mythology to boost the Greek economy and prevent the descent into a downward spiral. If some heroes don't appear, we shall have a Greek tragedy in the 21st century.

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### The Economic Influence of Immigration

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#### ABSTRACT

Immigration is often discussed as a politically significant topic relating to the ethical issues of the rights of immigrants and the negative implications that are associated with immigrants, commonly referred to as the "immigration problem." Immigration into the United States is a much greater issue than in most countries as millions of immigrants come into the country both legally and illegally every year. This trend has been rising in recent decades. Politically, this increase in immigration has been portrayed as a potential matter of national security or even as an "alien invasion," while the actual net economic effect is unknown and may actually be negligible. These terms are used by politicians, commonly by those on the right side of the political spectrum, to garner support for anti-immigration policies. The policies are attempts to limit the burden immigrants put on healthcare and the education system and to return to Americans the jobs "stolen" by foreigners.

The positive side of immigration is largely ignored though. Immigration helps to increase cultural diversity and expand the supply of labor in the American economy. Although many immigrants are low-skilled and have little education, still a large portion of immigrants are highly-skilled and educated. All immigrants positively affect the receiving country both socially and economically in some way, and these effects are largely ignored both by politicians and the public. As you can see, some of the effects of immigration have more than political ramifications, greatly influencing the economy in both positive and negative ways.

This paper will focus on the economic effect of immigration, namely on the United States economy, and will explore how immigrants influence the workforce and local economies with a large immigrant population. American immigration policy will be summarized, and the effect of these policies will be examined. The economic impact on the United States government's budget and politics, as well as the healthcare and education systems, will also be explored briefly. Through the analysis of immigration's effect on these sectors, this paper will attempt to determine the net economic effect of immigration on the United States economy.

#### **HISTORICAL BACKGROUND**

In 1883, Emma Lazarus, wrote the celebrated poem "The New Colossus" that in 1903 was engraved on a plaque placed on the pedestal of the Statue of Liberty. It read: "Give me your tired, your poor, Your huddled masses yearning to breathe free." Millions of immigrants from around the world quickly accepted the invitation forming a new national identity and democratic political structure that served as the very foundation upon which our current thriving agriculture and merchant economy is based.

The first era of significant immigration after the formation of the country was the First Great Migration, occurring "between 1881 and 1924, when 25.8 million persons entered the country." This migration flooded

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into America primarily from European countries, especially England and Germany, but also from Italy, and the Nordic and Eastern European countries. Most of the immigration during this period went through and settled in three large economic centers in the United States: Ellis Island in New York Harbor, Boston, and Chicago. This large influx of immigrants composed anywhere from 24 to 53 percent of the United States' annual population growth during this period, resulting in a population increase of nearly 75 million within this half century and a dramatic rise in the size of the labor force.<sup>III</sup> These new immigrants filled sweat shops and factories and helped to fuel America's economic boom by providing a cheap labor source as the country became an industrial and global power.

The first major attempt to control immigration occurred with the passage of the Immigration Act of 1924, also called the Johnson-Reed Act, which included the National Origins Act and the Asian Exclusion Act. Its passage limited the annual number of immigrants admitted from any country to 2% of the number of people from that country who were living in the United States in 1890. This act intended to control the influx of "undesirables" and the new quota system remained in place (with minor alterations) until the passage of the Immigration and Nationality Act of 1965. The influence of shifting to numerical quotas was a bit of a political folly that attempted to distinguish an American identity by favoring one group over another. The 1930s saw a greater drop in immigration as the quota system came into effect and as the Great Depression crippled economies world-wide, effectively ending the First Great Migration. From the thirties through the early 1970s, immigration was extremely limited, until immigration policy took upon a noticeable shift. The "number of legal immigrants has increased at a rate of about one million per decade, and is now nearing the historic levels reached in the early 1990s."<sup>iii</sup> The dramatic rise in legal immigrants currently residing in the country.<sup>iv</sup>

#### MODERN UNITED STATES IMMIGRATION POLICY

Modern immigration policy began in 1965 with the Immigration and Nationality Act. President Lyndon Johnson signed this act allowing more individuals from third world countries to enter America, including immigrants from Asian countries, whom were previously excluded entirely by the quota system. An important aspect of this act was that it welcomed individuals with skills and professions needed to support a growing economy. Since the late 1980s, the United States has been pursuing an active policy of enforcement and regulation, beginning as a result of Mexico being included in the General Agreement on Tariffs and Trade in 1986. With Mexico's inclusion in the trade agreement, the Mexican and American markets for capital, goods, commodities, services, and information have become more integrated under the free trade zone created between the two countries. Though many areas of the American and Mexican economies have become more intertwined over the decades, the United States government has resisted integrating the labor markets of the two countries and instead has adopted a policy of hostility to any labor migration from Mexico. Involvement with the Mexican economy was taken to the next level with Mexico's inclusion in the North American Free Trade Agreement (NAFTA) in 1993. Not only has trade increased eight-fold between Mexico and the U.S. from 1986 to 2002, but the number of Mexican immigrants entering with visas has also quadrupled.<sup>v</sup>

Many politicians, namely those on the right, have taken this increase in immigration from Mexico and used it as an excuse to pursue their own political interests by portraying immigration as a "threat to national security" and even an "alien invasion." Congress sought to increase the restrictions on immigration and so passed the 1990 Immigration Act, which took measures to augment the border patrol, increase deportations, and tighten sanctions on employers of illegal immigrants. The Clinton Administration continued this trend and increased funding for the protection of the border between the southern states and Mexico in an attempt to prevent illegal border crossings, as well as increased resources for the border patrol with the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) in 1996.

The federal government has also increased funding for the Immigration and Nationalization Service (INS) thirteen fold in the past two decades and the border patrol budget by more than ten times the 1986 level.<sup>vi</sup> In addition to these anti-immigration legislation and spending policies, the INS and border patrol conducted a series of operations to reinforce the American-Mexican border.



The first increase of security occurred along the El Paso-Laredo border with Operation Blockade, and the second occurred at the San Diego-Tijuana border with Operation Gatekeeper in 1993. Both operations increased the number of border patrol officers significantly as well as installed large concrete walls and detection technology. Although the number of apprehensions increased dramatically due to these measures as seen in Figure 1, <sup>vii</sup> many negative effects resulted. Since the fences could only extend a few miles around each targeted city, illegal immigrants began entering the country through new crossings in the countryside and along more dangerous points, one being crossing the treacherous Colorado River. With these new points of entry, the likelihood of being apprehended while crossing illegally has decreased significantly causing the border patrol to have to double its efforts. Because of the level of effort required and increased area necessary to patrol has increased as a result of these enforcement aggressions, the cost per







These increased costs have succeeded only in increasing the cost of immigration, while not significantly reducing the number of illegal immigrants entering or residing in the U.S.

#### EFFECT OF HIGHLY-SKILLED LABOR

Most people view immigration as only providing a large number of unskilled workers to the United States economy, but there are many factors necessary to consider when determining the net influence of immigration. The supply of skilled and educated labor needs to be established in addition to the unskilled and poorly educated labor. The supply of migrant labor is proportionally much greater in certain areas, primarily urban and developed areas as well as states along the United States-Mexico border, but also in areas of high technological growth.

Legal immigration allows for many highly educated and skilled immigrants to enter the country on student or work visas. These student visas allow foreigners to study in the United States and gain an education that they would have been unable to receive in their home country. This form of immigration provides a great source of highly-skilled labor because most foreign students study highly scientific or mathematically based fields of study. "Data from the National Science Foundation's Survey of Earned Doctorates show that between 1960 and the late 2000s, the share of PhDs awarded to foreign students rose from one fifth to three fourths in mathematics, computer science, and engineering; from one fifth to three fifths in physical sciences; and from one fifth to one half in life sciences."<sup>ix</sup> Not only is the level of foreign graduate students rising dramatically, but so is the number of academic papers published by and patents granted to the same highly educated immigrants.

This supply of highly-skilled workers to the labor force positively affects the quality of human capital in the United States when countries are sending over their best and brightest students. These immigrants supplement the normal American supply of highly educated professionals and help to increase the competition and productivity in the labor force mainly for the information, science, and technology industries. The technological advances developed by these research-heavy industries have raised the level of national welfare in recent decades as well as promoted innovation.<sup>x</sup>

Not only do highly-skilled immigrants enhance our economy in productivity and quality of human capital, they also add to the United States by contributing to and not straining the American welfare systems. Highly-skilled immigrants "are likely to pay far more in taxes than they use in public services, generating a positive net contribution to government fiscal accounts"<sup>xi</sup>

Researchers at the Center for Immigration Studies published a report in 2004 showing the significant level of educated immigrants participating in the American workforce. The popular conception is that most immigrants are uneducated and illiterate, but as the data demonstrates, less than 700,000 (30.32 percent) of the net increase of approximately 2,279,000 immigrants in the labor force from 2000-2004 had less than a high school education.<sup>xii</sup> Therefore a significant portion (69.68 percent) of newly arrived immigrants participating in the labor force in 2004 have at least a high school education and even 50.98 percent have more than a high school education.<sup>xiii</sup> These figures help to refute the common claim that most immigrants come to the United States uneducated and low-skilled. This increase in at least moderately-skilled labor contributes to the American labor force in ways other than supplying cheap, manual labor.

#### **EFFECT OF LOW-SKILLED LABOR**

Low-skilled immigration into the United States also has a large impact on the American economy, although in much a different respect than the effect of highly-skilled immigrants. Low-skilled immigrants are thought to primarily be in the country illegally, to avoid paying taxes, and to increase crime, but the level of correlation between these factors remains to be determined. According to renowned Harvard labor economist George Borjas, "low-skilled immigration greases the wheels of the U.S. labor market"<sup>xiv</sup>

A way that low-skilled immigrant labor contributes to the American labor market is by making higherskilled labor more productive. By doing jobs such as day care or lawn care, home cleaning or construction, low-skilled immigrants free up high-skilled labor to work longer, more efficiently, and more productively. Instead of having a parent stay at home to care for the children and run the household, both parents can manage to go to school, become better educated, and join the work force. "Low-skilled immigration thus indirectly contributes to productivity growth by raising the effective supply of high-skilled labor."<sup>xv</sup> Although low-skilled immigration positively influences the American labor force, this effect is immeasurable and is rarely taken into consideration in the immigration debate.

Another beneficial aspect of immigrant labor is its mobility. When jobs are difficult to come by or a new market for labor opens in a different area, American-born workers have a hard time relocating their family and lives to move where the jobs are. Immigrant families by nature are quite mobile when it comes to finding

work, which provides new markets a supply of labor that would likely have gone unmet by Americans. This mobility in the workforce helps to speed economic growth and "helps smooth fluctuations in the U.S. economy and ease the burden on U.S. workers when the unemployment rate rises."<sup>xvi</sup>

Low-skilled immigrant labor positively affects the American supply of labor by increasing its flexibility, elasticity, and mobility, but a greater issue presented with lower-skilled labor is the legality of the supply. Low-skilled and poorly-educated immigrant labor tends to be residing in the country illegally, and estimates indicate "three-fifths of immigrant workers with less than a high school education are undocumented."<sup>xvii</sup> The main focus of the immigration debate centers on addressing this issue and attempting to curtail the flow of illegal immigration into the United States. The effect of low-skilled immigrants in the United States has an impact on government finances that needs to be taken into consideration when trying to calculate the net effect of immigration.

#### **IMMIGRATION AND THE U.S. LABOR FORCE**

In tougher economic times, migrant workers tend to suffer a larger proportion of the economic burden, due to the higher elasticity of the immigrant population's supply of labor. The report on *Current Population Surveys* by the Center for Immigration Studies shows that in 2004, some 6.14% of foreign-born workers were unemployed (roughly 1,292,000), and only 5.79% of American-born workers were unemployed (7,085,000).<sup>xviii</sup> The period from 2000 to 2004, which is being analyzed in the data set, was a time of economic uncertainty for America with the occurrence of the terrorist attacks of September eleventh and the subsequent war with Iraq and the rising cost of housing. The immigrant population residing in the United States bore most of the burden of this economic uncertainty compared to the native-born population as witnessed by the increase in unemployment of both groups, but with a higher proportional job loss rate for immigrants.

Immigrants were also driven out of the labor force at a much higher rate than American workers, with a 15 percent rise in immigrants not participating in the labor force, compared to only an 11 percent rise in American-born workers not involved in the labor force from 2000 to 2004.<sup>xix</sup> Because immigrant workers have a greater elasticity in labor supply, they are the first group to feel the effects of economic hardships and are forced into unemployment and out of the labor force altogether more often than American workers. The ability for the foreign-born work force to absorb the effects of negative economic trends actually benefits the native-born working population and helps to keep their unemployment rate lower because of the presence of this highly elastic supply of labor.

Hanson has noted a significant change in the population of illegal immigrants that tie these trends to current economic times. "Since the last U.S. business cycle peak in 2007, the population of illegal immigrants has declined by about one million individuals."<sup>xx</sup> He attributes this sudden decline in the immigrant population to the economic recession because of the flexibility of this foreign-born labor source. Upon failing to find work, many immigrants have returned home, helping to not only reduce the effects of the Great Recession on the

American work force, but to also reduce unemployment in the United States by removing a large number of people from the unemployed and non-participating population.

Hanson summarizes the effect of low-skilled immigration on the U.S. labor market by stating "it is important to keep in mind that any wage losses to low-skilled native workers represent a change in the *distribution* of the national income but not in the *level* of national income."<sup>xxi</sup> Hanson assesses these changes in the distribution of income as a gain to U.S. employers and a loss to American low-skilled workers "with the gains to the former offsetting the losses of the latter."<sup>xxii</sup> Another point he makes is in reference to the surplus generated by immigration by making capital and land more productive, and how the benefit from this effect by far offsets any losses to low-skilled American workers. Although it may hurt a few unskilled Americans, the immigration of low-skilled labor into the United States is economically beneficial to the United States and usually to those workers who immigrate in the form of better jobs, wages, and opportunities.

#### **IMMIGRATION AND U.S. WAGES AND OUTPUT**

Immigration into the United States not only influences the labor force, but it also affects the wages of American workers. Basic economic theory explains the effect of an increase of labor, and it is commonly accepted that "immigrants will lower the price of factors with which they are perfect substitutes and raise the price of factors which they are complements."<sup>xxiii</sup> Based on these principles, the low-skilled labor introduced by immigration lowers the wage of unskilled workers, but having little to no effect on the return to capital or the wages of skilled workers. The increased supply of unskilled labor then increases the optimal output by shifting the supply curve of certain markets to the right thus, causing employers to use more of all inputs.<sup>xxiv</sup> This decrease in production costs for supplies ideally contributes to moving the long-run aggregate supply curve to the right, raising potential output and potential GDP. All these positive effects of immigration are theoretically based and are witnessed in the United States to a certain degree. The degree of truth to these effects is uncertain though due to the infinite intricacies of the U.S. economy, but these are the economic effects expected under the assumptions of perfect competition, information, and rational decisions.

The effect of skilled immigrants is usually reversed from the previous observations because of the supplementary nature of skilled labor to unskilled labor in production. An increase in skilled labor from immigration theoretically reduces the wage for skilled labor, but causes an ambiguous effect on the unskilled wage. The "fall in the skilled wage and the rise in skilled employment will lead to increased demand for the complementary factor, capital, and hence an increase in the return to capital."<sup>xxv</sup> In theory, this is how skilled labor introduced to the U.S. economy through immigration would influence the wages and supply of labor. However, the actual effect can be observed especially during a period of such economic uncertainty that we have now.

Using different economic models can produce differing results. The commonly used Heckscher-Ohlin Modern Theory of International Trade produces different results, for example. This model explains migration from poor to rich countries as being a result of the tariffs that wealthy nations have "on goods that make intensive use of unskilled labor, in an attempt to raise the domestic wage of unskilled labor above the world

level.<sup>\*XXVI</sup> According to this theory, the "immigration of unskilled labor from abroad will occur until the wage of such labor returns to the world level, by which point the country will be specialized in the production of the labor-intensive good.<sup>\*XXVII</sup> Applying this theory to the United States, we have a justification for immigration of unskilled labor into the country and a claim that this will persist until the labor markets of Mexico and the United States are integrated or until the price of low-skilled labor is equalized with the rest of the world. But this is assuming that both countries have similar factor endowments, which is not the case between Mexico and the U.S.

If the factor endowments of two countries are assumed to be very different, as in the case with the U.S. and Mexico, we witness different results. "Price equalization might not occur even with free trade," and instead countries will specialize in production: the country "with a large labor endowment will produce a more labor-intensive mix of goods," while the other will specialize in the production of more capital-intensive goods.<sup>xxviii</sup> In this case, factor price equalization will only be achieved through a large influx of labor to have any impact on the wage of the receiving country or through trade. This instance is more likely to be the case for the U.S., but Americans don't desire a decline in the wage level, so they will greatly contest any large inflow of labor or increase in trade that might impact their standard of living.

#### IMMIGRATION AND ECONOMIC INEQUALITY

Another aspect of the American economy I want to touch upon is how immigration influences economic inequality in the United States. A number of scholarly journals have been published on the topic and have expressed different views on the impact of immigration and I will try to assess the authority and evaluate the validity of the critique and data.

Dr. Deborah Reed discusses immigration and the wage structure in the United States and draws theoretically-based conclusions. She states that as poorly-educated immigrant workers enter the U.S. workforce, "they may compete with similar natives and bid down the market wage for low-educated workers. At the same time, they may bid up the wages of complementary workers such as better-educated workers in industries expanded by immigrants. Insofar as immigration increases the wages of highly educated natives relative to those with low education, immigration will increase inequality by raising the returns to education."<sup>xxix</sup> These statements are firmly based on commonly-accepted economic theories and although not applied directly to the United States economy, Reed suggests how an economy similar to the U.S.'s may be affected by immigration. By proposing the possible effects of immigration on the economy instead of making claims based on incalculable data, Dr. Reed presents a credible point of view on the influence of immigration into the United States.

Dr. George Borjas, one of the leading labor economists in the world, has published quantitative literature that supports these theories proposed by Reed. Here is an excerpt of his quantitative approach to immigration's effect on the wages of an economy's labor force:

To understand the impact of immigration on native employment opportunities, suppose we view labor market as a closed economy where a single competitive industry uses a linear homogeneous production function to produce *Q* units of a good (Joseph Altonji and David Card 1991). The production process uses both skilled and unskilled workers. The wage rates of skilled and unskilled workers are  $w_s$  and  $w_u$ , respectively. The cost function in this industry is then given by  $Qc(w_s, w_a)$ , where  $c(w_s, w_u)$  is the unit cost function. Perfect competition implies that the price of the output, *p*, equals the unit cost of production, so that  $p = c(w_s, w_u)$ .

Both skilled and unskilled workers purchase the good. Each type-*i* worker (i = s, u) has an output demand function given by  $D_i(w_i, p)$ . There are  $N_s$  skilled workers and  $N_u$  unskilled workers, and the fraction of unskilled workers in the population is *b*. Product market equilibrium requires:

 $Q = N_{\rm s} D_{\rm s} (w_{\rm s}, p) + N_{\rm u} D_{\rm u} (W_{\rm u}, p).$  (16)

To close the model, suppose the labor supply function of each type-*i* worker is

 $L_i(w_i, p)$ . Labor market equilibrium implies:

 $N_{\rm s} L_{\rm s} (w_{\rm s}, p) = Q c_{\rm s} (w_{\rm s}, w_{\rm u})$  (17)

 $N_{\rm u} L_{\rm u} (w_{\rm u}, p) = Q c_{\rm u} (w_{\rm s}, w_{\rm u}), (18)$ 

where  $c_i = \alpha c / l w_i$ .

Consider now what would happen if  $\Delta N$  immigrants enter the labor market exogenously. Suppose that the fraction of unskilled workers in the immigrant flow equals  $\beta$ . Under some simplifying conditions, Altonji and Card (1991, pp. 204-05) show that the resulting change in the wage of skilled and unskilled workers is given by:

 $\Delta \log w_{\rm s} = [\lambda / (\varepsilon_{\rm s} - \delta_{\rm s})] \cdot [(\beta - b) / b (1 - b)] \cdot \Delta N = \alpha_{\rm s} (\Delta N / N), \quad (19)$ 

 $\Delta \log w_{u} = \left[ (1 - \lambda) / (\varepsilon_{u} - \alpha_{u}) \right] \cdot \left[ (b - \beta) / b (1 - b) \right] \cdot (\Delta N / N) = \alpha_{s} (\Delta N / N), \quad (20)$ 

where  $\lambda = N_u D_u(w_u, p)/Q$ ;  $\varepsilon_i \ge 0$  is the labor supply elasticity of type-*i* workers; and  $\delta_i < 0$  is the labor demand elasticity for type-*i* workers.

Equations (19) and (20) give the reduced-form impact of immigration on the skilled and unskilled wage. Suppose that the fraction of unskilled workers in the immigrant flow ( $\beta$ ) equals the fraction of unskilled workers in the native pop-ulation (*b*). The linear homogeneity of the production function then implies that neither the skilled nor the unskilled wage changes as a result of immigration. Alternatively, if the fraction of unskilled workers in the immigrant flow exceeds the respective fraction among natives ( $\beta > b$ ), immigration increases the skilled wage and decreases the unskilled wage.

This conceptual experiment, therefore, indicates precisely how the impact of immigration on native employment opportunities can be measured. If we could observe a number of closed labor markets which immigrants penetrate randomly, we can then relate the change in the wage of skilled and unskilled workers to the proportion of immigrants in the population (after adjusting for the skill comp-osition of both the native population and the immigrant flow). The estimated parameters would summarize the impact of immigrants on native employment opportunities.<sup>xxx</sup>

As we can see from Borjas' equation, if all variables can be quantified, then the model could theoretically calculate the actual effect of immigration on the wages of native workers. The trouble now is in determining the values for all the variables, which in an actual economy is extremely difficult if possible at all. When

reports are published and they have no consideration for the ambiguity of calculating these variables and have no solid data to support their claims, the validity of their claims can be questioned.

Research conducted by the Federation for American Immigration Reform (FAIR) and published in their report on Immigration and Income Inequality attributes the growing disparity between socio-economic classes in America to the rising size of the immigrant population.<sup>xxxi</sup> The report by FAIR presents various data regarding the trends for middle and low-income households in the United States as well as the rising population of immigrants in the county based on U.S. Census data from 2000. The report fails to connect the data on rising immigrant populations and the increasing percentage of low-income households from 1990 to 2000 though, and only presents the data with weak correlations to the trends they are suggesting. They cite for example, information on the states with the largest immigrant populations and place it next to information on the decreasing size of the middle class.

The common argument that immigration is attacking the middle class is clearly their motivation for pairing this data, but I could have just as easily paired information of the rising American-born population with data on the rising price of beans in the United States and claimed that the birthrate of Americans is causing inflation. They show that the immigrant population has risen in California and that the size of the middle class decreased by 5% over the same time period, but that may or may not be a result of immigrants impoverishing the neighborhoods they move to or stealing jobs from the hands of Americans. The economy of California is enormous, larger than most foreign countries, and the state is currently having extreme budget issues, but they cannot claim that there is a direct relationship between increased immigration and the decline of the middle class. They make no factual attempt to neither connect the data nor show any degree of causation. According to FAIR's report, immigration to the United States is "inextricably linked" to the economic well-being of American households.<sup>xxxiii</sup>

The FAIR report uses another source of data, the National Research Council (NRC), for further information on immigration and American inequality. The NRC reports that "immigration is composed largely of some high-wage earners and many more low-wage earners."<sup>xxxiii</sup> This assertion may have data to support it, but they make no attempt to provide actual numbers and statistics to show what percentage of the immigrant population in the U.S. is actually illegal. This claim remains unjustifiable due to the difficulty in measuring the illegal immigrant population, but the study published by the NRC takes it as fact. An extremely apt statement of these limitations is found in the 2007 Congressional Budget Report: when considering the effect of illegal immigrants on the tax system and the U.S. economy, "currently available estimates have significant limitations; therefore, using them to determine an aggregate effect across all states would be difficult and prone to considerable error."

The report concludes with a factual statement based on economic theory: "As the supply of labor available for a specific job increases, there is less incentive for employers to offer higher wages to attract new workers, and wages tend to stagnate or fall."<sup>xxxv</sup> This statement I can understand and support if they had an evidence to show that it is actually occurring in the United States, for which there is no connection. Frankly, the Federation for American Immigration Reform is a special interest lobby group based in Washington, D.C.,

and that is the most we can expect from them, to represent their interest and to lobby for what they believe is right, whether it benefits Americans or anyone residing in America.

#### **IMMIGRATION AND THE U.S. TAX SYSTEM**

A common argument against immigration in the United States is that illegal immigrants don't pay taxes, and they are hurting our economy by using social welfare while not contributing their fair share. Although it is difficult to measure exactly how many illegal immigrants reside in the U.S., there is a degree of truth to this statement. If a low-skilled immigrant is residing in the United States, he/she is likely working off the books and not paying federal or state income taxes. On the other hand, illegal immigrants do contribute to the American tax system through sales tax and property tax when they purchase goods or a house. Because of the unequal distribution of revenue the government collects from immigrants, there may be a level of inequality that results. Due to the uncertain information we have regarding illegal immigrants, the exact net effect of their contribution or hindrance to the U.S. tax system is extremely difficult to calculate. I will detail the theoretical effects of immigration and attempt to determine if the net gains outweigh the net losses and resolve any discrepancy if one arises.

Low-skilled immigrants contribute to the government some of their share of taxes, but they also take advantage of government services for which they might not be helping to support. Most low-skilled immigrants are low wage earners, and therefore they "owe very little in tax and most illegal workers appear not to file tax returns."<sup>xxxvi</sup> It's safe to say they contribute very little to nothing at all in income taxes, but do they have much of an influence on the services funded by income taxes? Illegal citizens are unable to receive welfare benefits, because in order to do so they would have to be a U.S. citizen. Non-citizen legal residents are also excluded from receiving these benefits, so any form of immigration poses no negative influence on the American welfare system.

The major drain on government finances, cited by Hanson, "comes from public education—all children, regardless of legal status, must attend school—and public healthcare."<sup>xxxviii</sup> The stress that immigrants put on the healthcare system comes through the benefits that children of illegal immigrants receive as well as hospital emergency room services which are often at the expense of the American public as a result of most immigrants not possessing health insurance. An accurate source I have found to demonstrate the effect of immigration on not only government budgets, but also the healthcare and education system is the 2007 Congressional Budget Report on "The Impact of Unauthorized Immigrants on the Budgets of State and Local Governments," which I have found to be very comprehensive as it reviews data from 29 reports published over the past 15 years.

Because state, local, and federal governments provide different services to citizens and are funded by different taxes, they unequally bear the burden of illegal immigrants. Many federally provided public services are exempt from negative influence from such immigrants because of the stipulation of citizenship to receive benefits. These programs include "Social Security and such need-based programs as Medicaid (other than emergency services), Food Stamps, and Temporary Assistance for Needy Families. At the same time, the

federal government requires that state and local governments provide certain services to individuals, regardless of their immigration status or ability to pay."<sup>xxxviii</sup> Because the different levels of government receive revenue from different sources, some which illegal immigrants contribute to and others they don't, the financial burden of illegal immigrants falls more heavily on state and local governments.

Moreover, state and local government are responsible for the services of healthcare, education, and law enforcement, all of which are taken advantage of by immigrants. Estimates show that "the amount that state and local governments spend on services for unauthorized immigrants represents a small percentage of the total amount spent by those governments to provide such services to residents in their jurisdictions," and that "spending for unauthorized immigrants accounted for less than 5 percent of total state and local spending for those services."<sup>xxxxix</sup> It is accepted that illegal immigrants use some of these public services, often burdening the budgets allocated for these programs, but as we can see the effect is negligible compared to the entire budget these programs require. Because the revenues that the government collects from immigrants primarily goes to the federal government in the form of payroll and income taxes, "the federal government thus enjoys more of the fiscal benefits of immigration while states and localities are stuck with a much higher share of the costs."<sup>xd</sup>

The funding for these state and locally-provided social welfare services comes from tax revenues, but unfortunately the "tax revenues that unauthorized immigrants generate for state and local governments do not offset the total cost of services provided to those immigrants."<sup>xli</sup> The taxes paid to state and local governments by illegal immigrants fail to compensate for the total cost they pose on the services they take advantage of, although, even in states with high immigrant populations, such as California (the state with the highest population of unauthorized immigrants), the cost of services provided to immigrants is "less than 10 percent of total spending for those services."<sup>xlii</sup> Illegal immigration is indeed a strain to the society in which they live and work, but this burden is not seen as significant.

#### CONCLUSION

As we have seen, immigration into the United States comes in various forms, legal and illegal, educated and low-skilled, and all of these forms affect the American economy in different ways. Many aspects of the United States economy are influenced by immigration, some of which are benefitted, such as reduced costs of labor for employers and increased labor productivity. Negative effects include as the imbalance of government burden and increased unemployment for low-skilled American workers.

Although illegal immigration poses an added cost to the United States government, the low-skilled immigrant workers it provides to the U.S. economy helps to increase productivity, reduce costs for employers, and absorb some of the effects of economic slumps. High-skilled immigration provides a great source of intellectuals, increases competition and productivity in the U.S. labor market, and even contributes more than their fair share in government funding. Because immigrant labor is more elastic and mobile, immigrants are the first group forced out of jobs and the labor force during times of economic hardship, thus actually helping to keep American workers employed. Although wages are lowered for low-skilled American workers when

low-skilled immigrants increase the size of the work force, this effect helps employers by lowering costs for human capital, offsetting any losses to American-born workers.

Increased economic inequality is another negative result from immigration, but the economic gains from increased output and productivity help to negate any negative influences from immigration on the U.S. economy.

The influential financial journalist, Fullbright Scholar, and editor of Forbes, Peter Brimelow effectively summarizes the economic effects that I have consistently found through my research: immigration increases inequality in the United States, but it also raises the level of overall national income and the national income for native-born Americans.<sup>xiiii</sup> Because of the difficulty posed by attempting to calculate the net effect of immigration on the United States economy, I believe this statement qualifies as an accurate description of how the U.S. economy is influenced.

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## Time-Changed Lévy Jump Processes with GARCH model on Reverse Convertibles

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#### ABSTRACT

For decades, financial institutions have been very motivated in creating structured high-yield financial products, especially in the economic environment of lower interest rates. Reverse Convertible Notes (RCNs) are the type of financial instruments, which in recent years - first in Europe and then in the U.S. – have become highly desirable financial structured products. They are complex financial structured products because they are neither plain bonds nor stocks. Instead, they are structured products embedding equity options, which involve a significant amount of asset returns' uncertainty. Given this fact, pricing of Reverse Convertible Notes becomes a really big challenge, where both the general Black-Scholes option pricing model and the Compound Poisson Jump model which are designed to catch large crashes, are not suitable in valuing these kinds of products. In this paper, we propose a new asset-pricing framework for Reverse Convertible Notes by extending the pure Brownian increments to Lévy Jump risks for the underlying stock returns movements. Our framework deals with time-changing volatilities of stock options with Lévy Jump processes by considering the stocks' infinite-jump possibilities. We then use a discrete-time GARCH with time-changed dynamics Lévy Jump processes in order to derive the assets' valuations. The results from our new model are close to the market's valuations, especially with the Normal-Inverse-Gaussian model of the Lévy Jump family.

Keywords: Lévy Jump Process, Fourier transforms, exotic options, reverse convertible, stochastic volatility, GARCH

#### **1. INTRODUCTION**

This paper deals with a pricing methodology for structured products and more precisely, for the valuation of Reverse Convertible Notes (bonds). For decades, investors have been diligently searching for high-yield financial investment instruments in an economic environment of low interest rates. Thus, the increasing demand for high-yield products has given financial institutions plenty of motivation and opportunity to create financial structured products. Since the financial crisis and economic doldrums of 2008, the Untied States short-term interest rates have remained at the low level of 0-1% for a long and extended period of time. Chart-1 in the Appendix, which demonstrates the historical yield of the 13-week United States Treasury Bills, confirms this. Our data further indicates that during the mid-2011, the rates even became negative. These negative yields mean that investors would lose some of their investments by investing the assets in real term. This low-yield economic environment motivated many investors to

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look for those risky, high-yield driven structured products. A structured product is a financial asset in which the attributes of several other financial assets are combined in one. A Reverse Convertible Note (RCN) or Reverse Convertible Bond (RCB) is one of these structured products. It is a combination of a fixed-income note and an equity option. It's also an over-the-counter product. In general, a RCN is a short-term investment vehicle with a one or two year maturity date. However, the real attraction of a RCN is that it offers generous yields. Some of the products even offer a double-digit yield. This is highly desirable for such a short investment period, even when compared to 10-year U.S. Treasury bonds, which offer much less yield during the same period. Table-1 in the Appendix shows a list of sample Reverse Convertible Notes traded in the markets as of May 2011. From the details of this list, we can see the attractiveness of the coupon rates of reverse convertibles. Based on the data we obtained that there are more than 94% of RCNs have coupon rates with two digits during the period of year 2008 through 2012. In addition, since the U.S. Central Bank (the Federal Reserve) started the program of open market purchasing of United States Treasuries, in order to stimulate the U.S. economy--also called Quantitative Easing (QE) -- and decided to purchase \$40 billion mortgage backed securities on a monthly basis, beginning in the summer of 2012, the Treasury yields are going to be driven even lower across the Treasury yield curve. These kinds of economic environments have pushed investors to take risks in chasing high yields and more broadly demanding risky products, such as RCNs. Despite the attractive yield an RCN can provide, however, its risks and complexities can be a real challenge to most investors, and especially to retail investors. Chart-6 in the Appendix shows the changes in an RCN due to the changes of its underlying stock. When the underlying stock of a RCN drops to the pre-determined trigger value, the RCN will loss a portion or all principal. Therefore, an RCN is not principal protected, in general. An investor could, therefore, lose his/her entire investment, even though the note's issuer does not default. This is certainly different than a conventional note or bond. A RCN pays an unconditional coupon rate in exchange for forgoing any appreciation in the underlying shares. Over the term of the note, if the underlying shares have traded at or below the pre-determine ratio of their initial face value, the notes would be forced to be redeemed in shares instead of getting the principal amount in cash. In other words, there is an option built into this investment vehicle. Comparatively, a RCN is like a convertible bond in that the bond can be converted to underlying shares. However, unlike the convertible bond, a RCN gives the conversion right to the issuer -- not the note holder. At maturity, when the note's underlying stock price is lower than its pre-determined stock price (trigger price), the note can be either paid at face value or be converted into equity, as the issuer decides. In fact, we might consider a RCN as embedding a "put" option, held by the note issuer, who will exercise the option if the underlying stock price goes below the pre-determined level during the life of the contract. A put option gives the holder a right but not the obligation to sell the underlying stock with predetermined price at a future time. As a result, while investors are lured by the attractive yield offered by a RCN, they must bear in mind that they simultaneously write a put option, which could hurt them considerably when the stock price drops below the trigger level in the future. The reason an investor is able to get such a high coupon rate from a RCN is

that he/she sold the 'put' option to the issuer at the time of purchasing the security. The premium of the put option is the primary source of an RCN's high yield. Since the equity option is embedded in the note, the risk behaviors of the note are quite different from those of traditional fixed-income investment instrument, which might be very difficult for retail investors to comprehend, since the risks of RCNs are not linear because of the exotic options embedded in the products. It's not uncommon that some RCN investors were surprised to find out that they lost the face values of the notes, even when the issuer is not involved in a bankruptcy. As previously discussed, a RCN is a structured product with an exotic option embedded in the asset. More precisely, most RCN deals are constructed with a barrier put option(s). A barrier option is one whose payoff is determined based on whether the price of the underlying asset reaches the barrier (pre-determined price level) during the life of the option. A down-and-in barrier put option's payoff is zero when the underlying value is above the barrier. A down-and-in put option plus a down-and-out put option should equal a plain vanilla put option. As a result, the value of a down-and-in put option should be less than the value of the corresponding plain vanilla put option. Because a RCN is embedded with a down-and-in (knock-in) put option, the RCN's price movements are closely correlated to the underlying stock's volatility. In fact, the barrier options embedded in RCNs increase the complexity of the assets valuation. With a built-in knock-in put option, a RCN investor may lose the principal of his/her investment if the underlying stock price drops significantly. Therefore, this paper is to discover the risks associated with these products by providing a suitable valuation methodology for RCN products.

The rest of this paper is organized as follows: section 2 will provide the literature review. Section 3 introduces our valuation methodologies. Section 4 explains estimation processes and results. Section 5 draws the conclusions.

#### 2. LITERATURE REVIEW

Traditional option valuation concerns itself with the classic Black-Scholes option pricing model, which is based on the assumptions that an asset's returns follow Geometric Brownian motion and have constant stock volatilities. The assumption of stock return following Brownian motion has become a benchmark processes for asset's derivative pricing models. However, in practice, we see that stock returns do involve jump processes and time-changed volatilities. As a result, real world stock returns involve much higher volatility than the Brownian motion suggested, as demonstrated in Chart-2 and Chart-3 in the Appendix. The difference is that the data in Chart-3 shows the real value of the S&P 500 index obtained from the markets, while, Chart-2 illustrates the value of the S&P 500 index is derived from the Black-Sholes pricing model. Clearly, we can see that the data in Chart-3 (real market data) is more volatile and involves more frequent jumps than the ones shown on Chart-2. Chart-4 shows a single stock's volatilities and its price variation over a relatively long period of time. Similar to Chart-3, Chart-4 also indicates that stock return moves in a way of more frequent jumps. Chart-5 demonstrates the S&P 500 Index's Implied volatilities (VIX); the volatilities of low-risk single stock; and the volatilities of high-risk single stock, all of which clearly indicate that the volatilities of stock return are not constant over time. These significant

discrepancies have led researchers to revisit the geometric Brownian motion assumption. Because asset returns display this phenomenon -- a) returns jump over time; b) returns are stochastic; and c) returns and their volatilities are correlated -- the latest research literature proposes alternative pricing methodologies, such as Poisson Jump Process and Lèvy Jump Process, which can better capture the jump features of stock returns. Other literature has addressed the issues of a market's possibilities of large swings by adding Poisson jumps to Brownian distributions - one example being Merton's Jump Models. The purpose in adding Poisson jumps in the asset-pricing model is to model the large crash of the financial markets, or individual stock's swing movements, such as jump-to-default risks. However, other researchers, such as Carr and Wu (2004) and Li, Wells and Yu (2011) documented that there is evidence of small jumps that cannot be modeled using Poisson jumps. This evidence led to a new flood of research literature on developing methodologies to implement the models with those small jumps over the time. such as infinite-Lèvy jump processes. The models considering Lèvy jumps allow for more flexibility of asset pricing, especially for pricing options. The Lèvy jump process, named after the French mathematician Paul Lèvy, is a stochastic process with independent stationary increments. Many researches since Lèvy have been implementing this process to value derivatives. Barndorf-Neilsen (1995) first used inverse Gaussian type Lèvy jump process to model log returns of stocks. Madan, et al (1998), and Carr and Wu (2002) are among the few who proposed the methodologies of option pricing by considering return's distributions with jump processes. However, they used a continue time format to value European-style options. Because Lèvy jump is a better representation of the real world stock return movements, in this paper, we incorporate this process to evaluate RCNs - which some researchers have tried to evaluate in the past. For example, Wilkens and Röder (2003) used European - style put options to valuate the equity component of RCNs by assuming the underlying stock follows (GBM) and its volatilities are stochastic. They found that the RCNs were underpriced. We believe that Lèvy processes are more suitable than GBM and the general Gaussian driven processes, in evaluating a structured derivative, because it considers the stock return's jumps, skewness and excess Kurtosis etc. Deng, et al (2012) used a Variance Gamma type of Lèvy jump model to evaluate RCNs and concluded that RCNs are overpriced. However, a Variance Gamma approach is not the best approach in valuing a stock option, according to the research of Ornthanalai (2011). In his research, Ornthanalai tested five types of Lèvy jump models -including Variance Gamma model -- by utilizing a huge database of on index options and stock returns over more than a ten-year time period. He generated these time-changed models with an affine GARCH that are easy to implement. His research indicated that the risk premium of infinite-activity jumps "significantly" dominated that of the Brownian increments and therefore, infinite-jump, rather than Brownian increments, should be the default option pricing model. Furthermore, from his research results, he noted that Normal Inverse Gaussian type Lèvy jump with GARCH model (NIG-GARCH) indicated the best results among those five jump processes models when he compared log likelihood values. In fact, the NIG Lèvy jump distribution is the only member of the family of general hyperbolic distributions to have closed convolution. Because of the facts mentioned above, in this paper we propose a new asset pricing framework for RCNs and other similar structured products by considering: 1) a stock returns' Lèvy jump processes with the time-changed GARCH model; and 2) pricing exotic options with the return processes in 1).

#### 3. METHODOLOGY AND DATA

In our RCN pricing framework, we first establish a Normal-Inverse Gaussian (NIG) Lévy jump process with affine GARCH model. Then we built an exotic option - pricing model. Our approach is relatively easier to implement in a practical way. By using affine GARCH approach in a discreet time format, it's relatively easier to handle the return volatilities. Due to the complexity of a RCN product and in order to simplify the analysis, we can consider the structured product as an investment portfolio with the following two assets:

- (1) Long -- a corporate bond;
- (2) Short -- an exotic put option.

The issuer of the bond and the underlying stock of the option refer two different entities. The valuation of the proposed portfolio is:

$$RCN_{t}(B_{t}, f_{t}) = B_{t}(r_{t}, t) - f_{t}^{I}(S_{t}, r_{t}, K, H, t)$$
(1)

where, RCN<sub>t</sub> is the value of a reverse convertible note at time t. B<sub>t</sub> is the value of a corporate bond at time t. It's a function of interest rate  $r_t$  (it's risk-free rate plus the issuer's credit risk premium).  $f_t^I$  is the value of a exotic put option at time t. It's a function of underlying stock S, the strike price of the option K, and the barrier of the option H. The negative sign of the second term in equation (1) indicates that an investor sold the option to the issuer.

In the following subsections, we focus on deriving an exotic option valuation in order to pricing RCN. As we discussed above, we propose a new asset pricing methodology by introducing a probability distribution with a GARCH model:

#### 3.1: LÉVY JUMP MODEL

Assume Y, the log returns of a stock, follows Lévy jump processes. A Lévy jump process is a probability model for an unpredictable measurement with right continuous and left limit  $Y = \{Y_t\}_{t\geq 1}$  and it is a stochastic process under probability space ( $\Omega$ ) and filtration and Y<sub>0</sub>=0. Y has stationary increments<sup>\*</sup>. The increments are independent. Y<sub>t</sub> changes in such a way that the changes of the measurement in disjoint time intervals of equal duration,  $Y_{t_i+\Delta t} - Y_{t_i}$  and  $Y_{t_j+\Delta t} - Y_{t_j}$  are i.i.d.  $\forall i, j$ . Let  $X_{t+s} = Y_{t+s} - Y_t$ , S>0. We refer Y<sub>t</sub> as a Lévy process and X<sub>t</sub> as the Lévy innovation. The characteristic function of Y<sub>t</sub> describes the distribution of each increment is given by  $\psi_{x}$ . Many statisticians in all kind of fields use the methodology of generalized Fourier transform of a Lévy innovation when, the density function unavailable. According to probability theory, a characteristic function is the inverse Fourier transform

of the random variable's probability density function. Therefore, even though we aren't clear about the density function of Lévy innovation, we can still derive the security's value through inverse Fourier transform technique if we know its characteristic function.

Definition: for a scalar random variable Y, the characteristic function is the expected value of  $e^{itY}$ , where i is imaginary unit with  $i = \sqrt{-1}$  and  $t \in \mathbb{R}$  is the argument of the characteristic function. Mathematically,

where,  $F_Y$  is the cumulative distribution function of Y. f is variable y's density function. According to Lévy Khintchine Theorm<sup>\*\*</sup>, the characteristic function of Y<sub>t</sub> has the form

$$F_{Y_{x}}(u) \equiv E[e^{iuY_{t}}] = e^{-t\psi_{Y}(u)}, \quad t \ge 0,$$
(2)

where  $\psi_Y(u)$  is defined as exponent characteristic function. u is in the complex domain D such that (2) is well defined.

Let  $Y_t = \log \frac{S_t}{S_0}$  presenting stock's log return during time [0,t]. For next one-period Lévy innovation

conditioning at t,  $x_{t+1}$ , the generalized Fourier transform is

$$\Psi_{x}(u;t,t+1) \equiv E[e^{ux_{t+1}}] = e^{\psi_{x}(u;t,t+1)}$$
(3)

where,  $\psi_x(u; t, t+1)$  is conditional cumulated exponent of  $x_{t+1}$ . Comparing equation (2) and (3), we know that the exponent of the transform in Lévy innovation is not linear in time as in the Lévy process. Therefore, we cannot use Carr, et al (2004)'s approach to implement random time changing technique. Instead, we must apply the approach of Ornthanalai (2011) because Lévy innovations are assumed to be time homogeneous in one of their parameters:

$$\psi_x(u;t,t+1) = h \eta_x(u),$$
 (4)

where, h is the homogeneous parameter of  $x_{t+1}$  and it is independent from  $\eta_x(u)$  which is the coefficient in the cumulated exponent. At this point, in equation (4), the cumulated exponent of Lévy innovation  $x_{t+1}$  is linear in h. We can rewrite equation (4) as following without lose any value because  $h_{t+1}$  is known as time t:

$$\Psi_x(u,t,t+1) = h_{t+1}\eta_x(u),$$
 (5)

Now, equation (5) becomes a dynamic model that can generate the similar effect of a random time change on Lévy process. And  $h_{t+1}$  changes through heteroskedastic that can be used as GARCH approach.

#### 3.2: LÉVY GARCH MODEL

Now we can use discreet time to model an asset's return. Under a risk-neutral measure, an asset's return in an affine GARCH (1,1) is given<sup>+</sup>

$$R_{t+1} = r_{t+1} - d_{t+1} + B_{t+1} + J_{t+1} - (0.5h_{B,t+1} + \eta_{J,t+1}h_{J,t+1}),$$
(6)  
$$h_{B,t+1} = \gamma + \beta h_{B,t} + \frac{\alpha (B_t - ch_{B,t})^2}{h_{B,t}}$$

where,  $R_{t+1}$  is asset's return at time of t+1.  $r_{t+1}$  and  $d_{t+1}$  are risk-free rate and dividend yield at time t+1, respectively.  $B_{t+1}$  and  $J_{t+1}$  are the shocks at time t+1.  $B_{t+1}$  follows Brownian motion and  $B_{t+1} \sim$  Normal (0,  $h_{B,t+1}$ ).  $J_{t+1}$  is the Lévy jump innovation factor under risk-neutral measure.  $\eta_{J,t+1}$  is convexity adjustments at time t+1.  $\eta_{J,t+1}h_{J,t+1}$  is the cumulated exponent of the jump innovation.

#### **3.3: BARRIER OPTION VALUATION**

As we discussed before, a RCN has two components -- a bond and an exotic put option. The value of the RCN is the value combination of both the bond and the embedded put option. The value of a bond is straightforward. The difficulty of a RCN valuation involves evaluating the knock-in put option. In fact, it's relatively easier to evaluate a knock-out put option than a knock-in put option. Therefore, we value knock-out put option first and then we use the relationship that a knock-in put option is equal to a plain vanilla put option minus a knock-out put option. Under the condition  $Q = \{H < S_{t+\tau} \mid t < \tau < T\}$ , we have the knocked-out put option value:

$$f^{o}_{t} = E_{t}^{Q} \{ e^{-\int_{t}^{t+\tau} -d_{s} + v_{s}) dS} \max[(H - S_{t+\tau}), 0] \}$$
(7)

where, H is the barrier level of the option.  $E_t$ . denotes the expectation operator at a risk-neutral world measure at time t. v is the risk premium of the stock. If at time t+ $\tau$ , H≥S, the knock-out put option,  $f_{t+\tau}^o$ , becomes worthless. As we discussed before, the value of a knock-in option is the difference between the value of a plain vanilla put option and the value of a knock-out put option, i.e.

$$f_t^I \equiv f_t - f_t^o.$$

where,  $f_t^I$  is knock-in put option and  $f_t$  is a plain vanilla put option and as we explained before, the option embedded in a RCN is just a barrier knock-in put option,  $f_t^I$ . Letting P(t, T) denote the present value of one dollar, the plain vanilla put options  $f_t$  at time t should be:

$$f_{t} = P(t,T)E_{t} \{ e^{-\int_{t}^{t} y_{s} dS} \max(K - S_{t}, 0) \}$$

Letting g represent the probability density function of the average variance rate v in a risk-neutral world, and  $Q = \{H < S_t\}$ , then from equation (7) the value of a knock-out put option is:

$$f_{t}^{o} = \int_{Q} e^{-\int_{t}^{T} (r_{s} - d_{s} + \bar{v}_{s}) dS} (H - S_{t})^{+} g(\bar{v}) d\bar{v}, \qquad (8)$$

where, r is risk-free rate, d is dividend yield of a stock and v is the risk premium of the stock return. In our valuation model, g is the risk neutral join density function of Brownian and Lévy Jump innovation

distributions. If we know the join characteristic function of this process, then we can derive the join density function from inverse Fourier transform technique. In fact, we have the join characteristic function<sup>++</sup>

$$\Psi(.) = \Psi_B(.)\Psi_J(.). \tag{9}$$

where,  $\Psi_B$  and  $\Psi_J$  are characteristic functions for Brownian motion and Lévy jump innovation, respectively. If the jump follows NIG distribution of the Lévy jump family, then g is the join density of Brownian motion and NIG distribution. Then  $\Psi_J$  should be the characteristic function of NIG distribution correspondent to its density function. The same is true for other distributions in the Lévy jump family, such as Variance Gamma (VG) distribution, etc. (see Appendix for details of the characteristic functions).

#### 3.4: A DISCRETE TIME OF KNOCK-OUT PUT OPTIONS

In section 3.3 we described the stock option valuation model for a general term at a continue time. In this section, we simplify our model by considering the valuation in discrete time. We know that a knock out put option is a path - dependent option, which means the option value at time t is dependent on the value of previous time. For a knock-out put option, the option will be "knocked out" if it touches the barrier. So, a discrete time conditional knock-out put option, should have a payoff until  $t+\Delta t$ :

$$f^{o}(t + n\Delta t, 0) = \mathbf{1}_{s(t + \Delta t) > H} x \mathbf{1}_{s(t + 2\Delta t) > H} x \dots \mathbf{1}_{s(t + (n-1)\Delta t) > H} x Max[H - S(t + n\Delta t), 0]$$

where, S(t) is the underlying stock price at time t. At any time prior to the expiration of the RCN contract, if the stock price drops below a pre-specified barrier H, the put option is knocked out and becomes worthless. Analoging the analysis for equation (8) and (9), and considering the characteristic functions, we can rewrite the risk-neutral world knock-out put option value at time  $n\Delta t$  (with maturity T, T>  $n\Delta t$ ) as:

$$f^{o}(t, n\Delta t, \phi) \equiv E^{Q}[H - S^{\phi}(t, n\Delta t)]$$

where, E is the expectation operator under conditional probability measure  $Q = \{H < S^{\phi} \mid t < n\Delta t\}$ .  $\phi$  is the argument of the characteristic function that define the probability density function. At time t we have:

$$E_t^{\mathcal{Q}}[H - S^{\phi}(t, n\Delta t)] = E_t^{\mathcal{Q}}[H] - E_t^{\mathcal{Q}}[S^{\phi}(t, n\Delta t)]$$
(10)

From (6), we have the second term in the equation (10) as

$$E_{t}^{Q}[S^{\phi}(t,n\Delta t)] = E_{t}[E_{t+1}[S_{n\Delta t}^{\phi}]] = S_{t}^{\phi}E_{t}[e^{\phi R_{t+1} + a(t+1,n\Delta t;\phi) + b(t+1,n\Delta t;\phi)h_{B,t+2} + c(t+1,n\Delta t;\phi)h_{J,t+2}}]$$

Using the property of iterated expectation, we have

$$E_t^{\mathcal{Q}}[S^{\phi}(t,n\Delta t)] = S_t^{\phi} e^{a(t,n\Delta t;\phi) + b(t,n\Delta t;\phi)h_{B,t+1} + c(t,n\Delta t;\phi)h_{J,t+1}}$$

where,

 $a(t, n\Delta t; \phi), \ b(t, n\Delta t; \phi), \text{ and } c(t, n\Delta t; \phi) \text{ are coefficients. They are as}^{+++}:$   $a(t, n\Delta t; \phi) = \phi r_{t+1} + a(t+1, n\Delta t; \phi) + b(t+1, n\Delta t; \phi)\omega + c(t+1, n\Delta t; \phi)\omega k$   $-0.5\log(1 - 2b(t+1, n\Delta t; \phi)a' - 2c(t+1, n\Delta t; \phi)a'k)$   $b(t, n\Delta t; \phi) = -0.5\phi^2 + b(t+1, n\Delta t; \phi)(b'+a'c'^2) + b(t+1, n\Delta t; \phi)a'kc'^2$ 

$$+\frac{(\phi - 2b(t+1, n\Delta t; \phi) a' c' - 2c(t+1, n\Delta t; \phi) a' k c')^{2}}{2(1 - 2b(t+1, n\Delta t; \phi) a' - 2c(t+1, n\Delta t; \phi) a' k)}$$

$$c(t, n\Delta t; \phi) = b' c(t+1, n\Delta t; \phi) - \phi\xi(1) + \xi(\phi).$$

Now we can use the similar steps as in Bakshi and Madan (2000) to derive the knock-out put option valuation at time t as:

$$f_t^o(t, n\Delta t; H) = He^{-(r-d)n\Delta t} \Pi(t, n\Delta t) - S_t^\phi e^{a(t, n\Delta t; \phi) + b(t, n\Delta t; \phi)h_{B,t+1} + c(t, n\Delta t; \phi)h_{J,t+1}}$$
(11)

the characteristic function corresponding to the risk-neutral probability  $\Pi(t,n\Delta t)$  is,

$$\Psi = e^{(r-d)n\Delta t} \Psi(\phi) \tag{12}$$

where,  $\phi = (\phi_1, ..., \phi_{n-1}, \phi_n)$ . The characteristic function in equation (12) can be derived from equation (9) for a join characteristic function. Then we can use the following property to estimate the probability  $\Pi(t, n\Delta t)$ :

$$f(x) = \frac{F(x+h) - F(x-h)}{2h} = \frac{1}{2\pi} \int_{-\infty}^{\infty} \frac{Sin(ht)}{ht} e^{-itx} \psi(t) dt,$$

where, f(x) is a density function and F(x) is its probability function.  $\psi$  is join characteristic function of Brownian motion and Lévy jump innovation as we discussed above. The methodology we use above is based on n-dimensional Fourier inversion formula in Shephard (1991) and numerical method.

<u>3.5 DATA</u>

We obtained our RCNs data from Bloomberg where most of the issuers are global banks. RCNs are over-the-counter (OTC) products and market price data is very limited. We tested the RCN issues whose market prices were available. For the historical returns of the underlying stocks of RCNs, we also selected Bloomberg and we included longer time periods, including more than 4,000 of daily data for each stock ticker.

#### 4. RESULTS

Before we discuss the results, we need to explain the estimation processes. There are mainly two important estimation processes. Firstly, we need to estimate all the parameters in order to forecast volatilities. We used a maximize likelihood method for filtrated affine GARCH (1,1) model. Since we used only the return shocks that were generated from Brownian increments for GARCH model, the shocks that were generated from the Lévy jump innovation must be filtrated out before we use the GARCH model. Then, we can combine the results with the Lévy jump volatilities to get the total volatilities. Secondly, from the results of the previous step, we can value the barrier option and then we can value the RCN. Within the second step, at each time period  $\Delta t$ , we check the option value to see whether it touches the barrier. If it touched the barrier, the option is worthless. Otherwise, the option has a positive value. Then we calculate the sum of the present values of each option premium. Now we put more effort to discuss the

results. Because RCN data is limited, we test the model from many different perspectives. Firstly, we test whether the valuation results are closed to the market prices at a certain date. For example, we have the market prices for several RCNs as of May 21, 2011. We compare the valuation results from our valuation models to the market values at the same valuation date. Secondly, we compare the results with different models. Table-2 in the Appendix shows the results. The row of "Diff." refers to the differences of the absolute values from our model to the market quotes. We use the mid-values of bid and ask spreads as market quotes. From the table we can see that our valuations are very close to the market values for most of the RCNs except for the RCN with the underlying stock X -- the United States Steel Corporation. We believe that stock X has a relatively larger error than that of other stocks from the model because its option was deeply in-the-money, while others are at-the-money or out-the-money. In the table, we also list the estimated parameters from the three models: NIG, VG and pure GARCH. In each model, we valuated the RCNs with the same underlying stocks: IP (International Paper Company, BAC (Bank of America Corporation), X(United States Steel Corporation) and BBY(Best Buy Co. Inc). The results show that the model of VG overprices the RCNs and NIG closely prices the assets. This indicates that our model valuations are relatively close to market values. The result of VG overpricing is consistent with the research of others, such as Deng, et al (2012), even though our methodology is significantly different from their approach. In addition, we use our model pricing exotic options of the RCN other than European style option as they valuated. Both NIG and VG models show that the United States Steel Corporation has higher valuation errors compared to the GARCH only model. We believe that this phenomenon is due to the Lévy jump risks effects for a deep in-the-money exotic option. In Table-2, we also compared the valuation of four RCNs with four underlying stocks. For International Paper Company, the RCN is close to maturity and its volatility is relatively lower compared to the other stock options. As a result, its RCN value is almost the value of the note. This, in fact, is true and all three models show the same results because the options are zero. The parameters: gamma, alpha and beta are for the GARCH model, and the rest of the parameters are for the exotic option valuation model. All the parameters are higher for the companies where their options are in-the-money compared to the companies where their options are outthe-money with all three models. This is as we expected, because in-the-money options are more active or volatile than are the ones of out-the-money are. Our estimated parameter, µ, is zero for NIG model and is consistent with our expectation since  $\mu$  does not play any role in the option valuation. The parameters of coefficient  $\xi$  and convexity adjustment  $\eta$  are not zero for most of the underlying stocks. This means an adjustment is necessary. For the results of pure GARCH model, the results show that the valuations are also close to market values but less impressive than the ones from the NIG model. For example, the pricing error from the NIG model for the RCN with underlying stock BAC is 0.03, while the pricing error from the GARCH model for the same underlying stock is -0.13. The overall results indicate that the NIG model can more accurately evaluate a RCN when its exotic options are not deeply in-the-money (ITM), while if its exotic options are deeply in-the-money, the pure GARCH model has better performance. However, since a RCN is a short-term security and during the life of its contract, its embedded exotic option is highly unlikely to be deeply ITM. Therefore, the NIG model should be a good approach for the valuation of RCNs. Overall VG model is the least performer among the three models.

#### 5. CONCLUSIONS

In this paper, we developed a new asset pricing framework for one complex structured product --RCNs. Our simulation results indicate that the valuation based on our new proposed model are close to the real market pricing, especially for those RCNs when their underlying stock options are not deeply inthe-money. In addition, our valuation methodologies are easy to implement and are tractable. We also tested several models in the Lévy jump family and our results show that the Normal Inverse Gaussian (NIG) model provides relatively better results than other members of the family thus leading us to believe that the NIG model is more suitable to evaluate complex structured products, such as RCNs. The research and methodology in this paper can be used in valuation of other equity-linked products.

#### **ENDNOTES**

\*the distribution of  $Y_{t_i+\Delta t} - Y_{t_i}$  is the same as  $Y_{\Delta}$  for all t,  $\Delta \ge 0$ .

\*\* See Bertoin (1996)

+For proof, see Ornthanlai (2011).

<sup>++</sup>see Shephard (1991) Theorem 2.

+++For proof, please see Ornthanlai (2011)

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### APPENDIX

### Table 1: Reverse Convertible Notes Trading at The Markets

Underlying Ticker	Coupon	Spot Price	Knock-In	Srike	Dividend	Maturity
IP US Equity	10.00%	31.31	75%	27.24	3.2548%	6/30/11
BAC US Equity	9.75%	11.58	75%	13.34	0.3404%	6/30/11
X US Equity	19.75%	44.96	75%	17.74	0.4380%	7/26/11
BBY US Equity	10.25%	31.33	70%	35.45	1.9665	7/29/11

4	VIG Model IP	BAC	×	BBY	VG Model IP	BAC	X	ВВҮ	GARCH IP	BAC	Х	ВВҮ
MLE	-9633.846	-8648.725	-8547.6983	-8304.8	-866.857	-606.033	374.2886	-995.369	-9633.8459	-8649.0724	-8547.6983	-8304.7894
'n	0.0000	-0.0002	-0.0001	0.0004	0.0021	0.0025	0.0006	-0.0039	0.0000	-0.0002	-0.0001	0.0004
Y	0.0006	0.0009	0.0001	0.0011	0.0008	0.0663	0.0036	0.0159	0.0006	0.0008	0.0001	0.0011
α	0.0020	0.0083	0.0002	0.0017	0.0594	0.0796	0.0751	0.0328	0.0020	0.0076	0.0002	0.0017
β	0.0000	0.0361	0.8540	0.0000	0.7867	0.2748	0.8311	0.7879	0.0000	0.1301	0.8541	0.0000
'.	0.0004	0.0000	0.0000	0.2739	0.0799	0.8499	0.1250	0.0490	0.0001	0.0000	0.0000	0.0052
k	0.0000	0.0000	0.0000	0.0000	0.0835	0.3469	0.0927	0.1210	0.0000	0.0000	0.0000	0.0000
a'	0.0965	0.0000	0.5533	1.0000	0.1890	0.2411	0.1159	0.0614	0.0000	0.0393	0.6595	0.0077
b'	0.0943	0.0000	0.9534	0.2853	0.1428	0.0061	0.1073	0.0603	0.0000	0.0000	0.3918	0.0108
,ur,	0.0000	0.0000	0.9974	0.0000	0.0628	0.0004	0.0230	0.0209	0.0000	0.0000	0.0000	0.0000
h	0.0185	0.9987	0.8932	0.1136	0.0002	0.0012	0.0257	0.0216	0.0100	0.0011	0.7665	0.0076
Option Value	0.00	1.37	16.30	3.38	0.00	0.89	12.03	1.06	0.0000	1.5216	14.7445	2.7511
RCN	101.12	99.73	85.19	98.53	101.12	100.21	89.46	100.85	101.12	99.57	86.74	99.16
Diff.	-0.88	0.03	-2.31	-0.62	-0.88	0.51	1.96	1.70	-0.88	-0.13	-0.76	0.01

Notes: The Diff. refers to the differences from the market values. IP is the stock ticker of International Paper Company, BAC is the stock ticker of Bank of America Corporation, X is the stock ticker of United States Steel Corporation and BBY is the stock ticker of Best Buy Co. Inc.

Table 2: Parameter Estimations and Valuation Results of Different Models

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## Chart 1



## Chart -2



## Chart-3



## Chart-4



Chart-5









## The Death of an Arena?

## Sarbjit Singh<sup>\*</sup> and Ira Stolzenberg<sup>†</sup>

#### ABSTRACT

The New York Islanders is a National Hockey League franchise that has played in the Nassau Coliseum since its formation in 1972. If the team should leave the arena after their lease expires in 2015, can the Nassau Veterans Memorial Coliseum survive without a professional sports franchise as an anchor tenant?

#### INTRODUCTION

The Nassau Veterans Memorial Coliseum (the Coliseum) opened on February 11, 1972 (Venue Facts, 2012). The New York Nets (who then became the New Jersey Nets and have been reborn his year as the Brooklyn Nets) played an American Basketball League game that night against the Pittsburgh Condors (Koppett, 1972). The arena was built on the site of Mitchell Field, an Army/Air Force base located in the heart of Nassau County, that was closed in 1960 and acquired by Nassau County in 1961 (Venue facts, 2012). The 1,200 acre site now houses the arena, Museum Row and professional and amateur athletic facilities. The area on which the arena sits is now called the Nassau Hub, 77 acres of prime space, and has been the subject of much debate for utilization purposes since the County acquired the land. The Coliseum was completed at a cost of \$32 million (Venue Facts, 2012). This amount would be \$47.6, \$70.6 and \$104.4 million, using an annual inflation rate of 1, 2 and 3 % annually. It has been the home of a former ABA two-time championship basketball team that featured Dr. J (Hall of Famer Julius Erving), a four time championship NHL hockey team, numerous concerts featuring the most popular artists such as Neil Diamond, the Who and Bruce Springsteen, the circus, family oriented entertainment such as Disney on Ice, monster truck shoes, graduations and charitable events (Venue Facts, 2012).

#### **BRIEF HISTORY**

The New York Islanders are the principal tenants of the Coliseum. They were founded in 1972 and played their first game at the arena in October of that year. They won only 12 games that year, but by being a scrappy team they won the hearts of the fans. They made the playoffs in 1975 and won the Stanley Cup, emblematic of the National Hockey League championship, four straight years from 1980 through 1983. The team has seven members inducted in the Hockey Hall of Fame (Blackboard, 2012).

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Unfortunately, they last won a playoff series in the 1992-1993 season. They have gone through several ownership changes over the years and a checkered history when it came to effective ownership. One ownership group, headed by Howard Milstein and Steven Gluckstern, did not inject capital into the team as promised, and in the opinion of many, exposed their motive of purchasing the team to the obtain an opportunity to develop the Nassau Hub, the 77 acre area including and surrounding the Coliseum. They had purchased the franchise in 1998 for \$195 million and eventually sold the team in 2000 for \$190 million. The team is currently owned by Charles Wang, founder and former Chief Executive Officer of the giant software CA (formerly Computer Associates, Inc.), who purchased the team from Milstein and Gluckstern (Isleinfo, 2012). Wang's idea was to purchase and move a National Basketball Association franchise to the Coliseum, a move that would have doubled the number of

professional sports playing dates in the arena (41 hockey, 41 basketball). As it turns out, his ulterior motive was to form a partnership with Scott Rechler, one of the largest commercial developers on Long Island, and build and privately finance a new arena and develop the Hub area with retail, office and residential units, including a 60 story building. This project was called the Lighthouse Project and would cost approximately \$3.7 billion, but would have been totally privately financed (Rizza, 2009) (Isleinfo, 2012). Approval for the project had been continuously delayed by the Hempstead Town supervisor (where the land is located), Kate Murray, and many of her town board members. Their main concern was the citification of this area of the county and the effect on congestion, traffic, sewer, water and schools (Scheurman, 2010). They proposed reducing the housing units by 80% and limiting the tower sizes,

previously reduced by Wang from one 60 to two 36 story towers, down to nine stories (Scheurman, 2010). This, of course, was deemed unacceptable to Wang and his partner Rechler, as it would have significantly reduced the rate of return on the project investment (Winzelberg, 2011).

#### THE ISSUES

Why is all this relevant to our discussion? The Islanders are the only permanent tenant of the arena. They play 41 home games, some pre-season games, and for many years, no playoff games. A consulting firm, Camoin Associates, was retained by the Nassau County Industrial Development Agency to review the one-time economic impact during the construction period of the Coliseum, including job creation; the ongoing economic impact of spending at the site and visitors to the site, including job creation; and sales and occupancy taxes paid by visitors (Camoin, 2011). Camoin estimated that annually there are 43 hockey events and 82 non-hockey events booked at the Coliseum (Cantor, 2011). That amounts to 125 events per year, or an annual occupancy rate of over 33%. Barclay's Arena, which opens in September 2012, has already booked over 200 events (Heskell, 2012). Madison Square Garden, owned by Cablevision, a public company, owns the NBA Knickerbockers, NHL Rangers and WNBA Liberty, which account for well over 100 guaranteed playing dates.In addition, with concerts and other attractions, it runs about 320 events per year (MSG, 2009). In our opinion, the Coliseum clearly needs at least one, and ideally two permanent tenants to generate revenues that are desperately needed for maintenance and

improvements of the building. Madison Square Garden is four years older than the Coliseum and while privately owned, has undergone two renovations. The current and latest one is costing almost one billion dollars (Worden, 2011).

While Madison Garden is forty-four years old and continues to improve its physical and sportscape image, the Coliseum has not. The Coliseum is publicly owned by Nassau County and probably will not be able to be rebuilt without a plan that will show that the financing could take place without an increase in annual property taxes. In January 2011, a New York State oversight board took control of the county's finances (Halbfinger, 2011). Nassau County is one of the wealthiest counties in the nation but also one of the most heavily taxed (Halbfinger, 2011). The action was taken because the County was unable to balance its \$2.7 billion budget, and the State also believed that the budget was unrealistic. The State formed the Nassau Interim Finance Authority (NIFA) to oversee the ongoing financial situation. The County's main problems emanated from a bloated workforce, an inequitable property tax system and a reluctance to cut services or increase taxes. The last fiscal crisis in the County came ten years prior, and the County was bailed out with an infusion of \$100 million from the State (Halbfinger, 2011). However, with the current state of the economy, New York State is having its own budget stretched problems there is doubt that a bailout would be forthcoming, if needed.

With the takeover of its finances by NIFA, the County executed a preliminary an agreement with the Islanders (Arenaco SPE, LLC, 2011). Essentially the New York Islanders, if a new arena is built, would operate a new arena for a period of thirty years. In order to build a new arena, Nassau County or its agencies would have to issue general obligation bonds in a principal amount of not more than \$400 million (Arenaco, 2011). Under the terms of the proposed lease, the Islanders would pay the County the greater of \$14 million or 11.5% of Coliseum revenues, as defined (Arenaco, 2011). In order to issue the bonds, the County would have to hold a referendum for approval or disapproval of the voters.

Not more than a month prior to the referendum, the County laid off over 100 workers. Citizens were upset that the referendum was not held on a regular Election Day in November, and some felt that the County was trying to railroad a positive referendum vote through as a result of the expected light turnout. The voters turned down the issue of the bonds, which would have still have to be approved by NIFA, by a 57 to 43% tally (Sullum, 2011). A diverse group, including the Republican County Executive supported the plan, but a coalition of Democrats, fiscal conservatives, senior citizens on fixed income, Tea Party members, parents of young children and certain developers opposed the plan (Sullum, 2011) (Halbfinger, 2012). Some feel that there was resentment against helping Charles Wang, despite the fact that his Lighthouse Project would have privately financed a new arena (Winzelberg, 2011).

The bottom line is that it is now September 2012 and there is no public plan in place that will keep the Islanders on Long island and/or renovate the existing arena or build a new one. The County has put out a Request for Qualifications (RFQ) for a master developer for the Hub property (Hogan, 2012). Four developers applied, and one major developer on Long Island has subsequently dropped out (Hogan, 2012).

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## THE 2011 PROPOSALS

As stated before, a lease was proposed by the County and the Islanders, who would want to operate the new Coliseum (Arenaco, 2011). The Islanders financial projections were reviewed by Conventions, Sports, Leisure International ("CSL"), a planning and advisory firm that provides consulting and planning services to those companies in the convention, sports and leisure industries (CSL, 2011). The projections were also reviewed by Camion Associates, a professional services firm, who prepared an economic analysis report for the Nassau County Industrial Development Agency entitled the Uniondale Hub Redevelopment Project (Maragos, 2011) (Camoin Associates, 2011) and (Cantor, 2011).

The terms of the lease are summarized as follows:

- (1) The Islanders would operate the new Coliseum
- (2) The lease would be for a thirty year period, commencing after the expiration of the SMG lease in 2015.
- (3) The County would provide the financing of the new arena through a bond issue of \$400 million, of which \$350 million was earmarked for the construction of new arena and the balance for the construction of a convention center and a minor league ballpark.
- (4) The Coliseum would have a minimum of 17,000 seats and a minimum of 50 suites accommodating a minimum of eight patrons.
- (5) The Islanders' operating company would be responsible for condition, operation, maintenance and repair of the new arena. They would be also be responsible for the first \$500 thousand of capital repairs, per year, as defined in the lease
- (6) The islanders' operating company would also be responsible for utilities and insurance for the arena.
- (7) The design and cost of the new arena would be similar to the Prudential Center located in Newark, New Jersey and is home of the N.J. Devils hockey team
- (8) The annual rent to be paid to Nassau County is an amount equal to the greater of \$14 million or 11.5 % of all Coliseum revenues.
- (9) Coliseum revenues are defined as gross revenues, net of sales taxes, ticket taxes and ticket surcharges (which are remitted to the county and state) paid to the Islanders related to the operation of activities at the arena. These include revenues from hockey games, ticket revenues from other sports events and from family events, concerts and other entertainment; revenues from the sale of food, beverage, merchandise, other concessions, novelties catering, suite licenses, club seats, radio broadcasting, sponsorships, the internet, parking, and personal seat licenses. It excludes all other media fees such as revenues from cable and network television broadcasting. (Arenaco, 2011)

Dr. Martin R. Cantor, CPA, of the Long Island Center for Socio-Economic Policy, prepared a report for the Nassau County Executive Ed Mangano that analyzed the cash flow and economic impact of the new

Coliseum (Cantor, 2011). Dr. Cantor is an economist and economic development consultant to public officials, counties, towns, villages and industrial development agencies (Cantor, 2012). Dr. Cantor analyzed the lease between the County and the Islanders, the conceptual models assumptions used to project the revenues by the Islanders, CSL and Camoin, and the additional jobs projected to be created by the project.

The debt service calculations are the same for each model. Borrowings of \$350 million (for the Coliseum) at 6.25% for thirty years equals payments of \$25.837 million per year. Add interest only payments for the two year construction period brings the total debt service cost equal to \$818.51 million (Cantor, 2011).

The revenue differences are based on differences in the assumptions. Believe or not, the Islanders' revenues projections are the lower of the three. The Islanders used 49 hockey games, and 109 non-hockey events in their projections. Camoin used 125 events, 43 hockey and 82 non-hockey, with a total attendance of 1,365,000, compared to the Islanders' attendance projection of 1,769,600. Camoin used average hockey ticket prices of \$60, \$27 for other sporting events, \$28.13 for family shows, \$65.25 for concerts and \$30.75 for entertainment events (Camion, 2011). Sales taxes include only the amount that Nassau County would receive. The entertainment tax was \$1.50 per new ticket sales, and the hotel tax was fixed at 3%, generated by the new visitors anticipated. CSL compared the Islanders projections to the results of other comparable arenas. They believed that the Islanders' average hockey ticket price of \$64 was acceptable, but thought that the revenues from third party events (concerts, family shows) was too high. In addition, it reduced the revenues from sponsorships and premium seating (Cantor, 2011).

Comparative revenues, debt service costs, excess of revenues over costs and net benefits to Nassau county class one households over the 30 year lease

Revenues	Camoin	CSL	Islanders
11.5\$ Revenue Sharing	\$901,258,437	\$780,944,295	\$\$754,825,590
Sales Tax Revenues	\$221,283,353	\$177,101,981	\$141,535,620
Entertainment Tax	\$58,842,770	\$99,641,666	\$79,631,800
Hotel Tax Revenue	\$12,121,498	\$12,122,092	\$12,121,095
Total Revenue	\$1,193,533,058	\$1,069,810,037	\$988,115,105
Debt Service Costs	(818,512,480)	(818,512,480)	818,512,625)
Revenues Over Dept Service	\$375,020,578	\$251,297,557	\$169,602,625
Benefit to Class One Propery Owners	\$273,690,018	\$183,396,957	\$123, 775, 996
#- Class One Property Owners	\$382,900	\$382,900	\$382,900
Total Benefit Per Owner	\$714.18	\$478.97	\$323.26
Benfit per Year (over 30 years)	\$23.83	\$15.97	\$10.78

Source: Cantor 2011

Cantor also analyzed the projections of the jobs created and economic impact of a new arena, as proposed by Camion Associates:

		After Completion
Primary Jobs	806	2,111
Secondary Jobs	<u>709</u>	<u>929</u>
	<u>1,515</u>	<u>3,040</u>
New Wages	\$121 Million	\$139 Million
Primary and Secondary Spending	\$257Million	\$358 Million

Are these numbers reasonable? The only certainty would be the minimum of \$14 million that was to come from the Islanders. Dr. Cantor believes that the other revenue amounts appear to be conservative, based upon the number of events booked and the sales, entertainment and hotel rates established. In addition, the County executive has stated that this agreement does not include any other development rights to the property (Burton, 2011). However, these numbers show that there would be a reasonable chance that the revenues derived from the Islanders operating the Coliseum would cover the debt service costs, and therefore there would be no out-of-pocket costs to the Nassau County taxpayers.

### BENEFITS OF HAVING AN ARENA ON LONG ISLAND

Aside from the creation of new construction jobs for a limited period, new primary and secondary jobs, additional spending which leads to positive economic activity and tax revenues, there are other benefits to having an arena here. The Islanders stated that the team will leave the arena after their lease expires in 2015. This is the only major league franchise in an area with a population of 2.850 million citizens, not counting the neighboring New York City borough of Queens (Llexchange, 2012). Long Island might possibly lose the concerts, events and family attractions that they have been taking place here for the past 40 years. There will be a significant deficiency in the quality of life for the people who live here. There will be no indoor arena on Long Island with a capacity of 16,000 seats that could be needed for certain events. In addition, there is an intangible benefit of civic pride, that is, the region having a team and an arena that attracts first class entertainment (Camoin, 2011).

### WHAT DOES ALL THIS MEAN?

In the review of the 2011 Redevelopment Plan, the County Comptroller stated that in the year of 2004-2005 NHL season lockout when there was no hockey played, the Coliseum's SMG revenues did not decline significantly. The revenues were \$2,115 million in 2004, \$1,698 million in 2005 and \$2,472 million in 2006 (Maragos, 2011). It appears to us that the decline in revenue through the absence of hockey was significant. The Comptroller thought that the absence of hockey in that period indicated that the coliseum was able to book other events, and that the County could retain revenue despite the absence of the Islanders (Maragos, 2011). This would be now more difficult with the opening of the Barclay's Arena just a commuter train ride away. In a 2006 report, the Director of the Nassau County Legislative Budget Review, disclosed that in the 2001-2006 period, SMG earned a profit between \$600 thousand and \$2.5 million

annually, and the Islanders and Mr. Wang lost between \$12 and \$27 million annually (Naughton, 2006). In our opinion, the key to the Naughton report was a statement that the County broke even on the facility, however this was aided by a lack of capital maintenance spending (Naughton, 2006). Gary Bettman, commissioner of the National hockey League, stated that the "facility is long past its due date and he doesn't think that the county has done a particularly effective or spectacular job maintaining it" (Wolfle, 2012, p.2). We are six years further down the road. If the Islanders leave, if the bookings drop below 30%, if the County, in light of its current fiscal crisis, cannot provide the required funds for maintenance, repair and improvements, how long will it take before the building is physically condemned?

A recent article in Newsday, based on the Camoin Associates and Nassau County Comptroller reports indicated that the economic impact on Nassau County, of the current NHL lockout with the absence of the Islander's season, would be \$62.2 million; and the direct loss to the Nassau County treasury in the form of ticket taxes, share of concessions and parking would be \$1.1 million (Brodsky & Marshall, 2012).

### SOLUTIONS?

So where does Nassau County go from here? It is unlikely that a private developer will finance new arena, unless Charles Wang is willing to part with some of his fortune or Woody Johnson, the owner of the Jets and a principal shareholder in Johnson & Johnson, buys the team and puts up a new arena. Both are deemed unlikely as Johnson has an opportunity to buy the NHL Devils, as they are having financial difficulties and are located in New Jersey, where is he from. Wang has said that if he had the opportunity, he would not purchase the team again (Baumbach, 2009). He has spent over \$200 million of his own fortune in keeping the team afloat (Baumbach, 2009). Charles Dolan, the creator and Chairman of Cablevision which owns Madison Square Garden and the Rangers, has roots in Long Island and has the capital to build a new arena. Cablevision is also direct competitor of the Coliseum, and it is unlikely that the NHL let him own two teams. However, this year Madison Square Garden purchased the Forum in Inglewood, California for \$23.5 million and a promise for a major \$50 million renovation. The city would provide an additional \$18 million if the proposed renovation takes place (Vincent, 2012). This arena was the former home of the NHL Kings and the NBA Lakers, who moved to the Staples center in nearby Los Angeles. There have been no announcements currently to bring major league franchises to the Forum. But there is now a precedent by Madison Square Garden for acquiring an arena in a nearby competitive market. While the Garden would not own the Islanders, it could act in the capacity as its landlord in a refurbished Nassau Coliseum. In addition, having an arena in Manhattan and in nearby Nassau County could put an economic squeeze on the newly opened Barclay's Arena in Brooklyn, if Cablevision so desired.

Charles Wang could sell the team, which would be moved to another city. He could possibly retain ownership and move the team to Quebec City (a former NHL franchise city that is building a new arena), Kansas City (a city with a new arena but without a franchise) or possibly even the Barclay's Arena in

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Brooklyn. The latter might be a stop-gap measure as the seating capacity is below 15,000 for hockey. It is unknown if Islander fans would follow the team to Brooklyn via the Long Island Railroad (there is little parking in Brooklyn and suburbanites like to drive), or if Brooklyn residents like hockey. Chances are that the Brooklyn hockey fans are already fans of the New York Rangers.

Where would that leave the Coliseum and Nassau County? After 2015, a new lease would have to be negotiated with a firm that would operate the Coliseum. The County ran the building in its first years of operation, and then a lease was entered into with the Hyatt Company which eventually became SMG (Spectator Management Group). The lease has been said to not be equitable for the County and onerous for the Islanders, but we have been unable to obtain a copy so it cannot be commented on. Will a new company want to manage an arena that is left with perhaps 80 bookings and two state-of-the -art arenas just one hour away by train? Without the County having expertise in the operations of an arena and unless a company thinks it can maximize the number of events booked and resulting revenues, we believe that it would be difficult to profitably run the arena. If the County ran it, the chances are very good that there would be inefficiencies as a result of a lack of expertise. We believe, too, that with the current fiscal state of finances in the County, there will not be adequate funding for the proper repairs and maintenance of the facility. Just look west to Shea and Yankee Stadiums, and the physical deterioration of the two ballparks, and compare them to the state of Dodger Stadium, in the Chavez Ravine section of Los Angeles, which is 50 years old and still in excellent good shape.

We believe that in order to save the arena, there would have to be a partnership between the County and private interests. The proposals that were put forth for referendum vote by the taxpayers in 2011 appear to be sound, and will be subsequently discussed and analyzed. In our opinion, the key to this agreement is to limit the debt exposure to the County, and establish a partnership with significant Long Island companies who are willing to invest funds in a profitable venture that will also benefit their employees and the citizens of Long Island by making it a better place to live. In addition, assuming a bond issue that will be smaller, a better job of selling the agreement to the taxpayers of Nassau County is mandatory. Our research did not disclose any arena being financed with a unique partnership of public and private cooperation, such as this. But if the numbers can show a profit, and certain corporations want to accrue the goodwill of the taxpayers of Long Island by becoming good corporate citizens, it could be the solution to a very dire problem. Some believed that the referendum in 2011 did not pass because it was construed as the public helping a billionaire build an arena for his team, or the County was trying to surreptitious pass the measure by holding the referendum on August 1 instead of on Election Day in November. Everything has to be transparent, disclosed and on the table, and the citizens have to understand the consequences of the measure not being approved. If it is an attractive and equitable package, and the Nassau taxpayers still reject it, so be it. But they should have all the facts in front of them before they make a decision. According to a source, there still is belief that there will be a last minute solution to save the team and the arena. We believe that time is running out and that concrete plans have to be in place very soon. If hockey players know that a new arena is forthcoming, they would want to play here. Long Island is still a great place to work and live. The working conditions of the Coliseum are not very good. If the team gets better free agent players, it will draw more fans. More fans mean more revenues for the team, the operator of the arena and the County. The Islanders sold out almost every game when the team was competitive and was winning its four consecutive Stanley Cups, and averaging over 14 thousand fans as late as the 2003-04 season, a year before the first lockout (HockeyDB, 2012). There is no reason why it cannot happen again. There is also no reason why the arena could not get more bookings if the facility is a state of the art venue.

#### CONCLUSION

The Islanders are the key to the status of the Coliseum. Without a permanent, anchor tenant that will guarantee almost 14% occupancy, earn enough profit operating the arena to ensure that the team breaks even financially, and pays sufficient rent and generates taxes to create positive cash flow to the county that will cover the debt service costs; a renovation or construction of a new Coliseum will probably not be possible unless an angel drops from the sky. The arena is in a steady state of decay, and without the proper maintenance will probably not survive. That will further damage the standard of living and image of Long Island and just add to a long list of failures such as the loss of the Nets, the loss of highly skilled jobs through the sale of Grumman, the Long island Lolita, the Roslyn school district embezzlement and the wandering Islip garbage barge. We cannot wait until 2015. We believe that County must work in partnership with Mr. Wang and leaders of leading Long island businesses to provide a way to finance a new arena through limiting the exposure of the County that will allow approval by NIFA and county voters. Perhaps it might mean selling non-controlling shares of the team, as the Mets did this year to raise \$240 million. If an out-of-the-box solution cannot be found, perhaps this region of 2.8 million citizens does not deserve a new arena

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# Disability, Obesity, and Employment: Exploring Nationally-Representative Data

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#### ABSTRACT

A recent report by the Office of Disability, Aging and Long-Term Care Policy of the U.S. Department of Health and Human Services stressed the need for a national disability survey. We examine differences in the wording of disability questions in two nationally-representative data sets, the Behavioral Risk Factor Surveillance System (BRFSS) and the National Health Interview Survey (NHIS). We link this information to information on obesity and employment for disabled persons in order to predict employment for these individuals using difference-in-differences models. Disabled individuals are significantly less likely to work, a trend that may change in light of the 2008 amendments to the Americans with Disabilities Act of 1990.

#### INTRODUCTION

It is estimated that the Federal Government spent \$357 billion in 2008 on programs that provide services to adults with disabilities (Livermore et al. 2011a). This is one of the reasons we need to better understand this group of individuals and have access to nationally-representative data sets that allow researchers to assess the needs of this population (Livermore et al. 2011b) and to predict the effectiveness of current and proposed policies.

A recent review of 40 national surveys highlighted shortcomings in existing data, including extreme variation in measures of disability (or no adequate measure at all) and insufficient sample sizes (Livermore et al. 2011b). A subsequent report by the Office of Disability, Aging and Long-Term Care Policy of the U.S. Department of Health and Human Services stressed the need for a national disability survey (Livermore et al. 2011c).

The Americans with Disabilities Act (ADA) of 1990 expanded employment opportunities for people with disabilities. The ADA expanded on a previous disability law that only covered public sector employees and applies to private employers, state and local governments, employment agencies, and labor unions. The ADA was signed into law in 1990 and enacted two years later. As of July 1992, employers with 25 or more employees were covered, while employers with 15 or more employees were covered starting July 1994.

Consequently, questions on disability began to become more prevalent in national surveys. In 1993, the Behavioral Risk Factor Surveillance System (BRFSS) began to ask question on limitations in work

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and activities due to physical and mental health problems. However, these questions were "module" questions rather than "core" ones, and thus only asked of a very limited subset of respondents. In 2001, questions on use of equipment and limitations in activity were asked in the "core" component of the BRFSS (and thus asked of most respondents).

Perhaps the best effort in existence for a national, large-scale collection of disability data is represented by the National Health Interview Survey of Disability (NHIS-D), conducted from 1994 to 1997 (Livermore et al. 2011b). More recent, comparable disability collection efforts do not appear to exist.

Of the surveys Livermore et al. (2011b) summarized:

The BRFSS, MEPS, NHANES, NHIS, PSID, and SIPP contain a substantial amount of information on health and disability, but even among these surveys the level of detail varies considerably. Some, like the BRFSS, collect relatively simple information on issues relevant to disability, such as functional limitations, use of special equipment, and need for assistance or care. At the other end of the spectrum, the SIPP and the NHIS contain numerous measures of health status and disability (p.5).<sup>1</sup>

For this reason, we analyze data from the BRFSS from 1993 to 2008, and subsequently compare results with those from the 2008 National Health Interview Survey (NHIS), which contains much more comprehensive data on disability than does the BRFSS. One of the key advantages of the BRFSS is that state-level estimates can be made, with geographic information made publicly available.

Our aims are as follows: (1) To compare means between the 2008 NHIS and BRFSS data sets, (2) To predict employment for disabled individuals in the BRFSS and NHIS, using obese individuals as a comparison group in some models that utilize difference-in-differences (DD) analysis, and (3) To compare estimates using various different measures of disability. We also run some DD models using the full BRFSS and comparing pre- and post-1999, when some key ADA-related court cases took place.

#### WHAT QUALIFIES AS A DISABILITY?

The lack of consistency across data sets of the definition of a disability can be problematic, but more importantly, it is problematic when applying the ADA in court cases. Disabilities can include hearing impairments, vision impairments, physical disabilities, mental disabilities, self-care disabilities, and independent living limitations. Under the ADA, a disability is defined as: "(A) a physical or mental impairment that substantially limits one of the major life activities of such individual; (B) a record of such impairment; or (C) being regarded as having such impairment" (Thompson 2010). In order to be protected by the Americans with Disabilities Act, a person must be "qualified" (that is, able to meet the legitimate skill, experience, education, or other requirements of an employment position that he or she holds or seeks) as well as be able to perform the "essential functions" of the position either with or without reasonable accommodation.

In September of 2008, the Americans with Disabilities Act Amendments Act (ADAAA) was signed into law and became effective in January of 2009 (Thompson 2010). This act established that an "impairment,

which substantially limits a major life activity, need not limit other major life activities to be considered a disability" (p263). It provided two lists of major life activities under the headings of Manual Tasks and Major Bodily Functions.

Prior to these amendments to the ADA, two major court cases that severely limited the interpretation of the ADA and made it more difficult to file claims under the Act were Toyota Motor Mfg., Ky., Inc. v. Williams (2002) and Sutton v. United Air Lines (1999).2 It is for this reason that we run DD models preand post-1999, where we limit "pre" years to those prior to 1999 and "post" years to those after 2002.

#### DATA

#### Behavioral Risk Factor Surveillance System (BRFSS)

As the largest telephone-based health survey available, the Behavioral Risk Factor Surveillance System (BRFSS) has tracked health conditions and risk behaviors for adults 18 years of age and older in the US for more than 20 years. The survey is conducted by state health departments in collaboration with the Centers for Disease Control. While only 15 states participated in 1984, the number grew to 33 in 1987, to 45 in 1990, and to all 51 states (including the District of Columbia) in 1996. These data are publicly available from the Centers for Disease Control at http://www.cdc.gov/brfss, and provide information on a variety of personal characteristics, including gender, age, education, marital status, family income, and state of residence. In addition, measures of general health and health limitations are included, as well as anthropometric measures such as weight and height. We use years 1993-2008 in our analysis, as data on general health and disability are not available prior to 1993.

#### National Health Interview Survey (NHIS)

The National Health Interview Survey (NHIS), conducted by the National Center for Health Statistics and initiated in 1957, is a nationally representative cross-sectional household survey providing information on the health of the civilian noninstitutionalized US population. It is used extensively by the Department of Health and Human Services to follow trends in illness and disability. The NHIS provides demographic and socioeconomic information on individuals, in addition to information on employment, health care coverage, and illnesses. While the survey was initiated in 1957, it has been updated since every ten to fifteen years, and underwent substantial changes starting with the 1997 survey. Weight and height are available starting 1976. Prior to 1997, information on insurance and access to health care was not collected in the core questionnaire. In our analysis, we use NHIS data from 2008.

#### Self-Reported Obesity

To mitigate error due to self-reports, all weights and heights used in this analysis are adjusted for selfreport error. While opinions are mixed regarding the validity of self-reported data, it is generally agreed that men in particular tend to over-report height and women tend to under-report weight (Himes and Roche 1982; Kuczmarski et al. 2001; Spencer et al. 2002). Using the relationship between objective measures of weight and height and self-reported values from the National Health and Nutrition Examination Survey (NHANES), the weight and height values in the BRFSS sample was adjusted.<sup>3</sup> Because NHANES gathers information on both self-reported and actual weight and height, height is adjusted in the BRFSS using this information. The adjustment is done separately by age, gender, and race, and has previously been used (see, for example, Kelly and Tennant 2012; Chou et al. 2004; Cawley 1999).

#### **EMPIRICAL IMPLEMENTATION**

Our empirical model is based on a static labor supply model in which the decision to work includes the indirect costs of a lack of accommodations provided at a potential workplace. Note that while the ADA may have caused a shift in the labor supply curve to the right, it may simultaneously have shifted demand to the left, as employers may react to such laws by lowering employment to sub-optimal levels. The dependent variables of interest are outcomes related to employment. To investigate the effect that various measures of disability may have on employment, the following general equation is estimated:

$$Employment = \alpha_0 + \alpha_1 Dis + \alpha_2 X + \alpha_3 (unemp) + u$$
(1)

where *Employment* is a dichotomous indicator equal to 1 if the respondent is employed; *Dis* is a dichotomous indicator that is equal to 1 if the respondent reports having a disability and 0 otherwise<sup>4</sup>; *X* includes personal, parental, and demographic characteristics, including year of survey and state or region of residence; *unemp* represents the state unemployment rate in a given year; and *u* is an error term. Our coefficient of interest is  $\alpha_1$ , which shows the effect that being disabled has on employment. The measures of disability that we use, particularly the question regarding poor health, may not be an ideal measure for disability. Our measure for equipment use is more appropriate yet is only available in the BRFSS starting 2001 (and is a modular question, asked of only a subset of respondents, in 2002).

Since the potential endogeneity of disability may be of concern, we also run the following two DD models:

$$Employment = \beta_0 + \beta_1 Ob + \beta_2 Dis + \beta_3 (Ob * Dis) + \overline{\beta_4} X + \beta_5 (unemp) + \varepsilon_1$$
(2)

where *Ob* is a dichotomous indicator that is equal to 1 if the respondent has a body mass index (BMI) greater than or equal to 30 kg/m<sup>2</sup>, and 0 otherwise; and  $\varepsilon_1$  is an error term, and

$$Employment = \gamma_0 + \gamma_1 \operatorname{Pre99} + \gamma_2 Dis + \gamma_3 (\operatorname{Pre99} * Dis) + \gamma_4 X + \gamma_5 (unemp) + \varepsilon_2 \quad (3)$$

where Pre99 is a dichotomous indicator that is equal to 1 if the year is prior to 1999 and 0 otherwise; and  $\varepsilon_2$  is an error term. Our coefficients of interest here are  $\beta_3$  and  $\gamma_3$  for equations (2) and (3), respectively, which show the effects that being disabled has on employment, assuming that the comparison groups are comparable.

## RESULTS

Variables	Poor	Poor	Use Equip	Limited	Limited
	Health	Health- Alt		Work	Activity
Disability measure	-0.2695***	-0.3515***	-0.3570***	-0.0094*	-0.2802***
	(0.005)	(0.006)	(0.006)	(0.005)	(0.006)
Age	0.0542***	0.0537***	0.0517***	0.0123***	0.0553***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age squared	-0.0007***	-0.0007***	-0.0007***	-0.0002***	-0.0007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Black non-Hispanic	-0.0198***	-0.0334***	-0.0319***	-0.0251***	-0.0502***
	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)
Hispanic	-0.0066	-0.0286***	-0.0271***	-0.0257***	-0.0429***
	(0.005)	(0.006)	(0.006)	(0.008)	(0.006)
Other	-0.0600***	-0.0699***	-0.0646***	-0.0188	-0.0704***
	(0.010)	(0.009)	(0.009)	(0.012)	(0.008)
Male	0.1617***	0.1603***	0.1525***	0.0111***	0.1525***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)
Some high school	-0.0017	0.0205**	0.0194**	-0.0075	0.0265***
	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)
High school	0.1144***	0.1544***	0.1588***	0.0067	0.1562***
	(0.009)	(0.009)	(0.010)	(0.006)	(0.009)
Some college	0.1339***	0.1816***	0.1966***	0.0133**	0.1932***
	(0.009)	(0.010)	(0.011)	(0.006)	(0.009)
College	0.2033***	0.2559***	0.2740***	0.0274***	0.2620***
	(0.010)	(0.010)	(0.012)	(0.006)	(0.010)
Married	0.0042	0.0104***	0.0123***	0.0045	-0.0029
	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)
Divorced	0.0579***	0.0605***	0.0502***	0.0028	0.0545***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)
Widowed	0.0240***	0.0268***	0.0296***	0.0083	0.0163***
	(0.004)	(0.004)	(0.004)	(0.007)	(0.004)
Unemployment Rate	-0.0083***	-0.0124***	-0.0042**	0.0171*	-0.0058***
(State)	(0.002)	(0.002)	(0.002)	(0.009)	(0.002)
Observations	3,336,996	3,514,757	2,292,442	21,554	2,444,924

Table 1: Effect of Disability on Employment Using Various Disability Indicators, BRFSS 1993-2008

*Note*: Marginal effects from probit models are shown. Standard errors are reported in parentheses and are clustered on the state level. Controls for year of survey and state of residence are included in all regressions. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

Disability prevalence in this time period, using various measures of disability, ranges from 5.3 percent to 17.7 percent.<sup>5</sup> Means for demographic characteristics are remarkably similar between the two data sets, and the prevalence of obesity of approximately 31 percent for both data sets is expected. However, disability means exhibit more variation, partly due to differences in the wording of the questions. Self-reported poor health has a prevalence of 12.5 percent in the NHIS and 15.9 percent in the BRFSS. Approximately two percent of the NHIS sample has trouble with activities of daily living, usually problematic among older individuals and not a major concern for this sample. The prevalence of using

equipment, which has the same wording in both data sets, is very similar: 7.7 percent of the NHIS and 7.4 percent in the BRFSS, which is comforting.

Employment regressions using the full BRFSS sample are shown in Table 1. Regardless of the measure of disability used, disability consistently has a negative and statistically significant effect on employment. This is true even for *limited work*, which is only available as a modular question from 1993 to 1995. We initially regressed employment on only measures of disability, without any other covariates. (Results available upon request.) Another intriguing finding is that the coefficients of interest do not decline substantially in magnitude and maintain their levels of significance even after controlling for a rich set of covariates. Provided that observed and unobserved factors have similar effects on employment, this suggests that unobserved heterogeneity, or statistical endogeneity, may not be too problematic in this context. On the other hand, reverse causality, or structural endogeneity, would be a concern to the extent that employment affects disability. Since we would expect employment to have a positive effect on disability, our probit results are likely biased downward and thus conservative.

The effects of the remaining controls are as expected. Males and those with a college education are consistently more likely to be employed, confirming findings from the labor economics literature. The higher the state unemployment rate, the lower the probability of working.

Since endogeneity may still be a concern, we present DD results in Table 2. In columns (1)-(5), DD results suggest that disabled individuals are 0.76-7.11 percentage points less likely to work. Comparing pre- and post-1999, around which two significant court cases narrowly interpreted the ADA, we see that disabled individuals were significantly (2.75-5.58 percentage points) more likely to work prior to 1999.<sup>6</sup>

VARIABLES	Poor Health	Poor Health– Alt	Use Equip	Limited Work	Limited Activity	Poor Health	Poor Health – Alt
Disability measure	-0.2633***	-0.3313***	- 0.3547***	-0.0077	- 0.2649***	- 0.2755***	-0.4161***
	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)
Obese	0.0031**	-0.0062***	- 0.0055***	-0.0022	0.0177***		
	(0.001)	(0.001)	(0.002)	(0.005)	(0.001)		
Disability*Obese	-0.0238***	-0.0711***	-0.0064	-0.0076	- 0.0476***		
	(0.002)	(0.005)	(0.004)	(0.012)	(0.003)		
Pre99						0.0094**	0.0074*
						(0.004)	(0.004)
Disability*Pre99						0.0275***	0.0558***
						(0.003)	(0.006)
Observations	3,206,594	3,374,567	2,198,049	21,010	2,345,044	2,714,492	2,747,644
Note: Marginal effe	ects from probit	models are show	vn Standard	errors are re	eported in par	entheses and a	are clustered

Table 2: Effect of Disability on Employment, Difference-in-Difference Estimates, BRFSS 1993-2008

*Note*: Marginal effects from probit models are shown. Standard errors are reported in parentheses and are clustered on the state level. All controls included in Table 1 are included in all regressions. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

Results for the 2008 NHIS and BRFSS are presented in Tables 3a and 3b, respectively. Similarly to what we see in Table 1, all disability measures are associated with reduced employment probabilities. DD estimates presented in the even-numbered columns, however, are mixed. The significant results – limited work for the NHIS, poor health days and limited activity for the BRFSS – carry the expected negative signs.<sup>7</sup> However, *use equip\*obese* is positive (albeit insignificant) in all 2008 models. This may not be implausible, since those who have taken the initiative to use equipment may have expanded opportunities for themselves.

Variables	Poor Health	ADL	Use Equip for Walking	Ltd Work	Use Equip
Disability measure	-0.3426***	-0.5334***	-0.4726***	-0.4643***	-0.4168***
	(0.015)	(0.023)	(0.020)	(0.013)	(0.022)
Obese	-0.0169*	-0.0382***	-0.0300***	-0.0113	-0.0306***
	(0.010)	(0.009)	(0.009)	(0.010)	(0.009)
Disability*Obese	0.0069	-0.1486	0.0528	-0.0564**	0.0476
	(0.025)	(0.120)	(0.044)	(0.028)	(0.041)
Age	0.0541***	0.0500***	0.0510***	0.0576***	0.0504***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age Squared	-0.0007***	-0.0006***	-0.0006***	-0.0007***	-0.0006***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Black non-Hispanic	-0.0163	-0.0186	-0.0178	-0.0312**	-0.0207*
	(0.012)	(0.012)	(0.012)	(0.013)	(0.012)
Hispanic	0.0051	0.0073	0.0010	-0.0254**	0.0020
	(0.012)	(0.012)	(0.012)	(0.013)	(0.012)
Other race	-0.0755***	-0.0765***	-0.0791***	-0.0888***	-0.0785***
	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)
Male	0.1350***	0.1353***	0.1386***	0.1462***	0.1405***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Some high school	0.0000	0.0170	0.0093	0.0246	0.0177
	(0.021)	(0.020)	(0.021)	(0.021)	(0.020)
High school	0.1270***	0.1674***	0.1585***	0.1429***	0.1614***
	(0.019)	(0.018)	(0.018)	(0.019)	(0.018)
Some college	0.1680***	0.2123***	0.2049***	0.1881***	0.2112***
	(0.018)	(0.017)	(0.018)	(0.018)	(0.018)
College	0.2277***	0.2868***	0.2728***	0.2390***	0.2811***
	(0.018)	(0.016)	(0.017)	(0.018)	(0.016)
Married	-0.0297***	-0.0127	-0.0217*	-0.0516***	-0.0156
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Divorced	0.0380***	0.0345**	0.0419***	0.0493***	0.0349**
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Widowed	-0.0292	-0.0261	-0.0125	-0.0209	-0.0207
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Observations	19,407	19,415	19,416	19,409	19,413

*Note*: Marginal effects from probit models are shown. Standard errors are reported in parentheses. Controls for region of residence are included in all regressions. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

Table 3b: Effect of Disabili	y on Employme	nt, BRFSS 2008
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Variables	Poor Health	Poor Health – Alt	Use Equip	Limited Activity
Disability measure	-0.2718***	-0.3859***	-0.3344***	-0.2502***
	(0.005)	(0.005)	(0.006)	(0.006)
Obese	0.0016	-0.0077***	-0.0026	0.0184***
	(0.003)	(0.002)	(0.002)	(0.003)
Disability*Obese	-0.0069	-0.0363***	0.0019	-0.0368***
	(0.006)	(0.009)	(0.009)	(0.005)
Age	0.0537***	0.0539***	0.0514***	0.0545***
	(0.001)	(0.001)	(0.001)	(0.001)
Age squared	-0.0007***	-0.0007***	-0.0006***	-0.0007***
	(0.000)	(0.000)	(0.000)	(0.000)
Black non-Hispanic	-0.0379***	-0.0544***	-0.0437***	-0.0680***
	(0.008)	(0.009)	(0.008)	(0.008)
Hispanic	-0.0062	-0.0327***	-0.0329***	-0.0473***
	(0.007)	(0.008)	(0.008)	(0.007)
Other	-0.0555***	-0.0617***	-0.0640***	-0.0701***
	(0.011)	(0.010)	(0.010)	(0.010)
Male	0.1388***	0.1361***	0.1401***	0.1346***
	(0.005)	(0.005)	(0.005)	(0.005)
Some high school	-0.0280**	0.0010	0.0009	0.0104
	(0.013)	(0.012)	(0.012)	(0.011)
High school	0.0885***	0.1301***	0.1439***	0.1469***
	(0.013)	(0.013)	(0.013)	(0.012)
Some college	0.1226***	0.1730***	0.1928***	0.1973***
	(0.015)	(0.014)	(0.014)	(0.013)
College	0.1923***	0.2462***	0.2735***	0.2703***
	(0.016)	(0.015)	(0.015)	(0.015)
Married	0.0254***	0.0273***	0.0337***	0.0182***
	(0.006)	(0.006)	(0.006)	(0.006)
Divorced	0.0507***	0.0543***	0.0476***	0.0490***
	(0.004)	(0.004)	(0.005)	(0.005)
Widowed	0.0358***	0.0362***	0.0438***	0.0267***
	(0.006)	(0.006)	(0.006)	(0.006)
Unemployment	-0.0252***	-0.0246***	-0.0249***	-0.0240***
Rate	(0,000)	(0,000)	(0,000)	(0,000)
(State)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	375.993	381,047	380.841	379.533
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*Note*: Marginal effects from probit models are shown. Standard errors are reported in parentheses. Controls for state of residence are included in all regressions. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

## DISCUSSION

Our study confirms the need for consistency in measuring disability across data sets and further highlights the need for a national disability survey if we are to better understand this group of individuals.

Using the BRFSS and NHIS, we find that, when disability is measured similarly, prevalence estimates are similar. However, differences can be stark when disability is measured differently. This is less problematic with regression results, which, regardless of the measure of disability, consistently show

negative and significant effects of disability on employment.<sup>8</sup> The definition of a disability needs to be further clarified, in addition to its relationship to obesity. The recent ADAAA is a step in the right direction.

## ENDNOTES

1. Note that: MEPS = Medical Expenditure Panel Survey, NHANES = National Health and Nutrition Examination Survey, PSID = Panel Study of Income Dynamics, and SIPP = Survey of Income and Program Participation.

2. See Thompson (2010) and Kelly and Tennant (2012) for more detail on ADA court cases, particularly those related to obesity.

3. Coefficients used in the correction utilize NHANES III (conducted between 1988 and 1994), NHANES 99 (conducted between 1999 and 2000), NHANES 01 (conducted between 2001 and 2002), and NHANES 03 (conducted between 2003 and 2004), reported in Rashad (2008). The NHANES surveys are publicly available from the National Center for Health Statistics at http://www.cdc.gov/nchs/nhanes.htm.

4. Several measures of disability are used: Whether the respondent reports (1) being in fair or poor health (*Poor Health*), (2) being in poor health for at least one of the 30 days prior to being surveyed (*Poor Health – Alt.*), (3) having used equipment for his or her disability (*Use Equip*), (4) being limited in work due to health problems (*Limited Work*), or (5) being limited in activities due to health problems (*Limited Work*), or (5) being limited in activities due to health problems (*Limited Work*), or (5) being limited in activities due to health problems (*Limited Work*).

5. Weighted summary statistics for the two data sets and additional statistical results are available upon request.

6. It is important to note that there were fewer disabled individuals prior to 1999 (Kelly and Tennant 2012).7. Note that *limited work* is not available in 2008 in the BRFSS.

8. This is similar to findings that analyze the ADA, including DeLeire (2000), Acemoglu and Angrist (2000) and Kelly and Tennant (2012). Tennant (2006) finds positive effects of the ADA on home-based employment for disabled workers, while Kelly and Tennant (2012) and Jolls (2004) find that the ADA increased educational attainment for disabled individuals.

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## A Blended Learning approach to the teaching of Sports Economics

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#### ABSTRACT

Teaching sports economics to undergraduates presents a number of challenges for any instructor. Most students coming into the course are more interested in the "sports" component of the title than the "economics" component. This paper examines some of these issues and extends previous research on performance outcomes based upon a major redesign of the course in the fall of 2011. This redesign focused primarily upon the face to face environment that more fully integrated the online course management system. Analysis using a censored Tobit regression model with grade outcomes as the dependent variable, does not find that course enrollment in the fully blended course significantly impacted students grades. Student evaluations conducted during the semester reported a higher level of satisfaction with the redesigned course than previous incarnations of the class.

#### **1. INTRODUCTION**

The sports economics course presents a number of challenges to any instructor. In the absence of a major in Sport Management, the course is generally not a required course for any particular curriculum, and usually attracts students with a wide and diverse background in economics. Most students coming into the course are really hoping to talk mostly about sports as opposed to fully discussing the economic modeling and analysis of sports markets. So despite the word economics in the title, students are initially resistant to the introduction of economic methodologies into what for many is one of their favorite past-times. This paper examines some of the issues in teaching the course to students and extends my previous analysis (see Vogel 2011) of performance outcomes based upon a major redesign of the course in the fall of 2011.

This redesign focused primarily upon the face to face environment that more fully integrated the online course management system, thus allowing almost 100 percent of the available class time to be used for the delivery of course content and active learning exercise. All written assignments and course exams were moved to the online environment. Additionally, the textbook was changed from a fully comprehensive and costly textbook to an inexpensive and more focused textbook that was supplemented with additional articles that were embedded in the course management system. This discussion focuses and assesses differences in student performance and outcomes from previous learning environments.

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The sports economics course has been taught at Farmingdale for close to ten years, beginning first as a combined Sports and Entertainment economics course, which was split several years later into two separate courses. Initially the course was developed as a service elective for students in all disciplines at a time before the campus had a major in economics which was then adopted by the Business Management program as an optional course in their minor in Sport Management. The minor eventually grew into a concentration, at which point the course became a required core course. Two years ago, the Sport Management major was approved, and the sports economics course is now a requirement for this program. With enrollments in the sport management program growing (they are now approximately 120) evaluating the success the sports economics course under various delivery methods is of increasing importance.

Preliminary analysis of student grade outcomes from the redesigned course, are not significantly different from previous courses. Traditional face to face courses across the last 8 years are fairly similar with a class average grade ranging from 67 to 73 (with the exception of one course with a class average of 56), a standard deviation of approximately 34 points, and a median grade of 84. Hybrid and online course averages are between 67 and 77, with a standard deviation of close to 25 points, and a median grade in the low 80s. That said, there were some significant differences in classroom dynamics between the redesigned course and previous face to face and hybrid courses, suggesting that the redesign was successful. More students purchased the cheaper textbook – and thus, more students were familiar with the course readings and materials in each class. As a consequence, classroom discussion by students and participation in in-class group exercises appeared to be more productive than in previous iterations of the course.

The rest of this paper is organized as follows; Section 2 provides an overview of the online, hybrid, and teaching issues. Section 3 describes how the last iteration of the course differed from previous versions. An analysis of course outcomes is presented in Section 4. The conclusions of this study are presented in Section 5.

#### 2. TEACHING IN ECONOMICS

Economics has been slow to adopt new teaching methodologies and techniques. According to Watts and Becker (2008), while chalk and talk still predominates in most economics classrooms, there is evidence of an increasing use of a range of methodologies. Among them are the use of PowerPoint and computer based

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presentations, computer-based exercises, and increased use of classroom discussion and exercises. Watts and Becker also indicate that methods such as classroom experiments, the use of current news and newspaper articles, and examples from the field of sports are on the rise.

A number of recent studies demonstrate how examples, simulations, and situations from professional sports have been incorporated into classroom instruction – primarily for general economics courses such as principles, as well as courses such as econometrics. A study by Bruggink (1993) describes how to incorporate baseball to teach basic economics principles such as the production possibility frontier, exchange and Pareto optimality, marginal product and diminishing returns, marginal cost and supply. Bruggink's focus is primarily on latching onto the students' interest in baseball (or any other sport for that matter) to enhance the teaching of principles of economics courses to students, or as he puts it, ..."By relating subject matter to student interests, students can be motivated without sacrificing rigor" (1993, p. 289). Cebula (2009) also demonstrates how cases and examples from professional sports can be used to illustrate issues and problems for students of economics and free enterprise. The example that he focuses on is marginal revenue product, player productivity and wage rates in the NHL. Einholf (2006) on the other hand uses the NCAA March Madness basketball tournament to introduce students to auction, risk management and portfolio theory.

A number of simulations have been developed for use in the sports economics classroom as well. Rascher (2005) for example describes a baseball management simulation to be used in a graduate level sports economics and finance course to simulate the outcomes that would result from team management's decisions on eighty-two different choices including payroll, facilities, and ticket prices. Surdam (2009) uses the card game War in an in-class simulation to demonstrate the outcomes predicted by Rottenberg's invariance principle. Baird (2005) developed a classroom simulation to illustrate potential outcomes arising from owners' decisions on team composition and salaries from an in-class draft and auction for players. Einholf (2005) describes a fantasy-football simulation to be used across a semester allowing students to see the impact of their choices and decisions on team financial success and league outcomes.

Both Booth (2009) and Von Allmen (2005) provide a rationale for the existence of the Sports Economics course and the topics and concepts covered in the course. At its core, besides being a growing area of legitimate academic inquiry with an ever expanding literature, over the last 30 years, students are genuinely

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interested in the topic. Thus, alongside the need for the course as a core requirement in a sports management or sports administration program, it is a popular topic with students. The range of materials from textbooks to supplemental materials, and the wide availability of video (from YouTube), and vast media coverage of professional, collegiate, and international sporting events (e.g. the Olympics), help to provide a wealth of teaching tools that can be brought into the classroom. Sports itself is an excellent vehicle to spark student interest and helps to illustrate core economic concepts beyond the principles course.

Teaching asynchronously online differs significantly from the traditional face-to-face environment. Many of the materials used such as a textbook and other course readings, lectures, PowerPoint, written assignments, and exams are very similar to those used in the traditional classroom. However, students and instructors very rarely interact in real-time with each other. Instead, students must actively engage in the online class environment in order to progress through the course. In a traditional classroom on the other hand, especially large lecture classes, students can often passively sit through class, and then simply submit exercises and take their exams at the designated times and dates. With the online class though, very often the student is expected to participate in a range of online activities such as discussions, group exercises, and online bulletin boards that the instructor can readily observe and track. It should be noted that this discussion focuses on online courses with enrollments of 20-40 students, not the MOOCS that have received widespread media coverage over the last few months.

Unlike the traditional classroom, almost every aspect of the online course must be planned and set in place before the course goes live to students. All assignments must have clearly established parameters, instructions need to be concise and understandable, course modules and links need to open and close at the right times and function correctly. The instructor can never be sure of when a student is going to log on to the course and work on their assignments, and thus will not necessarily be available to respond to a student's two in the morning on a Saturday request for clarification on an assignment or report that the assignment did not open up like it was supposed to and now the time to complete it has passed. Additionally, student and instructor interactions take place in a more formalized and in general, written fashion.

Cavanaugh (2005) finds that online courses are more labor intensive or time consuming to teach than similar face-to face courses. Alongside a significant sunk cost in developing and establishing the online

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course materials, he finds that teaching in the online environment is significantly more time intensive as a result of increased student contact and individualized instruction per student.

Hybrid or blended courses on the other hand, take advantage of the features of both the traditional classroom and the online classroom. Instructor-student interactions occur both in the classroom and online, introducing a greater level of flexibility to the delivery of course content. Course content and assignments may be housed in the course management system, but content delivery occurs through both the traditional classroom and asynchronously. The instructor does need to decide which activities should be conducted in the classroom and which activities should be reserved for the online course management system – i.e. problem sets, group discussions, class discussions, content delivery (lectures), and exams.

#### **3. PAST AND CURRENT COURSE**

Regardless of mode of instruction, the sports economics course over the past five to six years has maintained an overall uniform consistency. There are four essential elements to the course – class discussion, low stakes written assignments, an audience review journal, and two exams.

In the fully online environment, the exams have consisted of two open ended essays that in general require the students to employ a range of materials and concepts from the two respective halves of the class. In the classroom, the two exams were generally essay exams consisting of five to six essay questions that the students were required to complete four of them in a seventy-five minute period. The low stakes written assignments have in general either required the students to prepare short abstracts of the readings (usually five to six out of the eight sets of readings assigned for the course from the textbook and supplementary articles embedded in the course site) or short analytical responses to specific issues and problems (again generally five out of eight assignments).

The audience review journal required students to attend several sporting events (the specific number would vary according to the time frame of the particular semester the course was offered in) as well as view an event on television. They then had to submit an analysis of the various economic aspects of the event that they were able to observe and collect about the event (e.g., pricing, advertising and marketing, strategy, stadium operations, etc.).

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Class discussion took on many different forms. Online, it was in the guise of formal online discussion forums – one or two for each course module (generally eight total). Students were generally required to participate in six to eight of the discussion forums (again depending on the particular semester that the course was offered in). Discussion questions centered around one of the topics of the particular module open at the time, such as ticket pricing and demand related issues, or player costs and the concept of MRP. Inclass discussions generally took up many of the same topics again centered on the particular module of material being covered in the class on that particular day – though they may also have included some group exercises. Group exercises were not utilized in the online courses.

In the strictly online class, course lectures consisted of primarily either short fully developed written materials, or a number of short slide/PowerPoint presentations focusing upon the central themes posed from the assigned readings. Face-to-face classes were generally lecture based, with half of the class usually reserved for lecture, and the other half reserved for group exercises and class discussion. In the hybrid and blended classes, class time was primarily reserved for class discussion, though there was some portion of each class reserved for lecture.

A central concern with most online and hybrid instruction is how much of the work is completed by the student themselves. While this is even an issue for traditional face to face instruction, many assignments can be crafted to reduce the ability of students to cheat, and the in-class proctoring of exams can additionally reduce students' ability to engage in cheating. That is not to say that student violations of academic integrity do not occur in the traditional classroom, but that depending upon the type of assignment in question, it is very often easier to design assignments and proctor exams that make it more difficult for students to engage in these types of behavior. The same thing though is true of online assignments, and there are a large number of tools that the instructor can utilize that limit a student's ability to engage in this type of behavior undetected (for example requiring students to submit assignments through Turnitin software). Most modern course management software has features that readily allow for timed assignments with questions assigned in random order, and the ability to lock students into the current window that they are working inhibiting the ability of the student to open multiple windows that would allow them to conduct internet searches while engaged in a timed assignment such as an exam.

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From the fall of 2009 through 2011, the sports economics course was scheduled as a traditional face to face course online twice (fall 2009 and fall 2011), a hybrid course once (spring 2010), and online three times (intersession 2010, intersession 2011, and summer 2011). From fall 2009 through summer 2011, the course structure and materials for both the online and classroom courses were the same. While lecture materials and class presentations varied from the online and traditional classroom, they were all built around the same set of readings, textbooks and order of the material. The primary materials in use at the time were Fort's Sports Economics textbook and Golfonomics by Shmanske, which was used as a supplement to illustrate various aspects of economic analysis and concepts surrounding individual sports and competition.

The cost of textbooks is an ongoing issue facing college students and instructors alike. New through the Farmingdale bookstore, the two textbooks combined were approximately \$250. Used, the books would run about \$200. Over time it had become apparent that larger numbers of the students were not purchasing the textbooks – and many of them did not use the copies that were at the reserve desk in the library either. Eliminating the supplemental textbook to make the cost of books more affordable for students would have resulted in removing an important topic from the course that Fort's text did not cover. But even eliminating Golfonomics from the course would still not reduce the cost of textbooks substantially.

In the fall of 2011, the course was completely redesigned using an inexpensive and non-comprehensive paperback, Szymanski's, Playbooks and Checkbooks, an Introduction to the Economics of Modern Sports. This was the only required textbook for the class and came in at a cost of under \$50. All of the other supplemental readings for the course were articles gathered through the Farmingdale library databases and embedded directly in the course site. Instead of using the hybrid model of 75 minute classes once a week with everything else on line, the class was scheduled for 150 minutes once a week. Half of the class time was reserved for lecture, and the rest of the class was reserved for class discussion and group exercises. All written assignments and exams were online. The previous spring, the course had been taught in a hybrid format, with class time reserved almost exclusively to class discussion (short 25 minute mini-lectures and the other 50 minutes was devoted to discussion and group exercises) and two in class proctored exams.

Moving the exams from classroom to the online environment was made possible by both the randomizer feature of the course management system and the ability to set a fixed and irrevocable time limit to the exam. Once the student opened the exam, they had 75 minutes to complete the four essay questions which were

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presented in random order, with no ability of the student to return to a previous question once they had moved on to the next one. While this may have amounted to what could be termed, open book exams, students did not have much time to sift through lecture notes and the textbook while taking the exam given the fact that they essentially only had about 18 minutes a question. Although students did not have foreknowledge of the questions, they were all based in large part on prior written assignments. So if a student had completed all of the written assignments up to that point in the course, they would have been well prepared to tackle the exam questions. Students were also required to certify that they had adhered to the Farmingdale honor code and fully understood the penalties associated with violations of the honor code.

Although it is impossible to say that no level of cheating took place, random checks of student's responses to exam questions for plagiarism and wholesale copying and pasting from web materials or even course materials was apparent. Student responses in general were consistent with the limited time that they had to respond to the questions and overall exam scores were not out of line with previous courses where exams were proctored. Median and average exam scores for the online exams were 67 and 80 respectively on the midterm and 64 and 79 respectively on the final exam in the course. Grading the exams online was also more uniform as I was able to employ a feature that allowed me to grade question by question (without knowing which student had submitted it) as opposed to exam by exam (which is usually the case when using the standard exam book). This tended to make the grading fairer for all students.

#### 4. ANALYSIS OF OUTCOMES

The outcomes from the three modes of instruction are evaluated using a modified production function. Assume that the grade a student obtains at the end of the semester depends upon a number of attributes such as innate abilities (A) and student work input (X) into the course, and course type (traditional, hybrid, or online – T). Student *i*'s score (grade) production function is

g = g(x, A, T), with  $g_x \ge 0$ , and  $g_{xx} < 0$ . (1)

where  $g_x (\leq 0)$  is the marginal score/grade productivity with respect to student effort. Further assume that this function can be expressed as a Cobb-Douglas style production function of the form:

 $\log g = \alpha + \beta_1 \log x + \beta_2 \log A + \beta_3 \log T + \varepsilon, \quad (2)$ 

where  $\alpha$  and  $\beta$  are parameters to be estimated, and  $\epsilon$  is an error term. An additional variable is included under T for the fully redesigned course, or what I will refer to as the blended course B as opposed to

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traditional or hybrid. The analysis is conducted across all sections of sports economics from 2006 through fall 2011. Summary data for all of the variables included in the analysis is presented in Table 1. There are a total of 208 observations from seven courses – one hybrid, three online, three traditional courses, and the blended course

Attendance (Attend) is measured as a percentage of total class time available. For a 3 credit online course in this analysis, this is assessed as the total number of hours (minutes) a student was logged into the course during the semester using 45 hours (2700 minutes) as the index standard. For the traditional and hybrid courses, attendance is taken simply as the total number classes the student attended divided by the total number of classes held during the semester.

#### **Table 5:** Summary Statistics

	GRADE	ATTEND	GENDER	INTERS	ONLINE	HYBRID	BLENDED
Mean	69.40302	0.525385	0.1875	0.221154	0.317308	0.149038	0.144231
Median	82.83036	0.576296	0	0	0	0	0
Maximum	100	1	1	1	1	1	1
Minimum	0	0	0	0	0	0	0
Std. Dev.	31.41413	0.334715	0.391254	0.416025	0.466551	0.356986	0.352171
Skewness	-1.37545	-0.156841	1.601282	1.34376	0.78505	1.970994	2.025308
Kurtosis	3.362649	1.677582	3.564103	2.80569	1.616304	4.884819	5.101873
Jarque-Bera	66.72429	16.00895	91.64672	62.92447	37.95853	165.4624	180.4864
Observations	208	208	208	208	208	208	208

All of the other variables in the analysis are dichotomous dummy variables for either individual student attributes (Gender), or course attributes. For Gender, the variable is equal to 1 for a female student and 0 otherwise. Only 19 percent of the students in the analysis are female. Twenty-two percent of the students were enrolled in intersession courses (INTERS), 32 percent were enrolled in online courses, 15 percent were enrolled in the hybrid course, and 14 percent were enrolled in the blended course.

The analysis is conducted as a censored Tobit analysis and the results are reported in Tables 2 and 3. Two analysis are conducted – one on grades, and the second with attendance as the dependent variable to evaluate whether the course format affected class attendance.

Variable	Coefficient	Std. Error	z-Statistic	Prob.
С	4.526062	0.084532	53.5426	0
LOG(ATTEND)	0.570746	0.076998	7.412432	0
GENDER	0.098323	0.114221	0.860821	0.3893
ONLINE	0.623526	0.175675	3.549313	0.0004
HYBRID	-0.235367	0.134285	-1.752744	0.0796
BLENDED	-0.105657	0.140388	-0.752608	0.4517
INTER	-0.217775	0.168838	-1.289844	0.1971
Scale C(8)	0.609419	0.031942	19.07891	0
R-squared	0.251052			
Adjusted R-squared	0.220922			
S.E. of regression	0.623271			
Sum squared resid	67.59328			
Log likelihood	-168.1115			
Avg. log likelihood	-0.923689			
R-squared	0.251052			
Adjusted R-squared	0.220922			
Mean dependent var	4.240653			
S.D. dependent var	0.706133			
Akaike info criterion	1.935291			
Schwarz criterion	2.076127			
Hannan-Quinn criter.	1.992384			

#### Table 6: Grade Production

\*182 observations after censoring 0 grade values,

Overall, the regression on student grades does not find that course grades in the revised, blended course were significantly different from the traditional face-to-face class. Attendance significantly impacts student grade performance, and students in online courses outperformed students in traditional or hybrid classes. The regression results also indicate that students in hybrid courses performed worse than students in traditional or blended courses.

With regard to class attendance, it does appear that both gender and the type of course that students were enrolled in did impact their attendance. Female students appeared to have higher attendance than male students – the regression coefficient on this variable is positive and significant at the 10 percent level. Online students had lower levels of attendance than students enrolled in all other types of courses. Or in other words, students were more likely to attend courses that met face-to-face, regardless of whether it was a traditional, blended, or hybrid course, than they were to attend the online course.

Variable	Coefficient	Std. Error	z-Statistic	Prob.
С	-0.492554	0.095993	-5.131155	0
GENDER	0.250262	0.140973	1.775247	0.0759
ONLINE	-0.98354	0.198031	-4.966596	0
HYBRID	0.02667	0.167185	0.159525	0.8733
BLENDED	-0.073397	0.172092	-0.426499	0.6697
INTERS	-0.103046	0.211706	-0.486742	0.6264
SCALE:C(7)	0.770861	0.039649	19.44228	0
R-squared	0.296877			
Adjusted R-squared	0.273697			
S.E. of regression	0.785545			
Sum squared resid	112.3088			
Log likelihood	-218.9927			
Avg. log likelihood	-1.158691			
Mean dependent var	-0.806321			
S.D. dependent var	0.921748			
Akaike info criterion	2.391457			
Schwarz criterion	2.511521			
Hannan-Quinn criter.	2.440098			
Mean dependent var	-0.806321			
S.D. dependent var	0.921748			

#### Table 7: Attendance

\*189 observations after censoring 0 attendance values.

#### 5. Conclusions

Overall, the regression analysis does not find that enrollment in a blended course impacted students grades either positively or negatively. On the other hand, students in online courses tended to have higher numerical course scores and lower levels of attendance. There is no indication that switching away from an encyclopedic textbook to a resulted in any negative impact on learning in the classroom. As a matter of fact, student evaluations conducted during the semester reported a higher level of satisfaction with the course and the course materials than previous incarnations of the class.

Anecdotal evidence from the courses suggests that instructor-student interactions were of a higher quality in face to face and blended courses than they were in online and hybrid courses. Many instructors at Farmingdale and likely many other institutions would probably suggest this as well. This is still an ongoing issue of inquiry and given the ever increasing blending of multiple modes of instruction available to students in need of further study.

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# Behavioral Finance and Retirement Preparedness: Road to Financial Security and Well-Being

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### ABSTRACT

Behavioral finance is the study of the combination of behavioral and cognitive psychological theory with conventional economics and finance. The influence of emotion and psychology on investors subsequently affects the financial markets. Irrational or unpredictable human emotion is a key driver of the market. There is evidence that individuals typically make illogical decisions when they spend, invest, save and borrow money.

Behavioral finance research has made important, relevant contributions to retirement saving and investing. This research displays an innovative perspective on participant behavior and its basis. Education and communication programs alone may not be effective in changing retirement planning behavior.

### INTRODUCTION

When individuals are faced with making decisions, emotion and psychology tend to influence their decisions. They contemplate the pros and cons of their choices while taking into consideration prior experiences in similar situations before making a final decision. The primary causes for passive and active saving and investing choices are results of behavioral tendencies. There is evidence that individuals typically make apparently irrational or illogical decisions, as opposed to how they should, when they spend, invest, save and borrow money are all factors of behavioral finance.

Behavioral finance is the study of the combination of behavioral and cognitive psychological theory with conventional economics and finance. The influence of emotion and psychology on investors subsequently affects the financial markets. Irrational or unpredictable human emotion is a key driver of the market. Individuals guided by short-term emotions can lead to poor decision making. These individuals want immediate gratification and expect positive outcomes sooner rather than later which may cause them to track progress in the smallest time segments possible. An unrealistic extreme short-term focus on investment performance (i.e., days, a month, a quarter or a year) instead of looking at the long-term performance over 5 to 10 years can lead these investors to believe that it is more efficient to get rich quickly rather than get rich slowly but surely. Many hours being spent studying information without incorporating valid information in improving final decision making can lead to recency, inaccurate forecasts which are the result of investors using present conditions and recent market trends to make

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forecasts. The key concepts of behavioral finance are Anchoring, Mental Accounting, Confirmation and

Hindsight Bias, Gambler's Fallacy, Herd Behavior, Overconfidence, Overreaction and Availability Bias and Prospect Theory (Phung, 2011).

The concept of anchoring draws upon the tendency for people to attach their thoughts around a reference point despite the fact that it may not have any logical relevance to the decision at hand. Anchoring can also be a source of frustration, as investors base their decisions on irrelevant figures and statistics. For instance, some investors invest in the stocks of companies that have fallen considerably in a very short period of time. In this case, the investor is anchoring on a recent high that the stock has attained and as a result believes that the decrease in price provides an opportunity to buy the stock at a discounted price.

Mental accounting refers to the tendency for people to divide their money into separate accounts based on criteria like the source and intent for the money. According to the theory, individuals allocate different functions to each asset group, which often has an irrational and negative effect on their consumption decisions and other behaviors. The importance of the funds in each account also varies depending upon the money's source and intent. Even though many people use mental accounting, they may not realize how unfounded this line of thinking really is.

Confirmation bias refers to how people tend to be more attentive towards new information that confirms their own preconceived decisions about a subject. The confirmation bias suggests that an investor would be more likely to look for information that supports his or her original idea about an investment instead of researching the information that may contradict it. The hindsight bias characterizes how people believe that after the fact, the occurrence of an event was completely obvious. Many events seem obvious in hindsight. Hindsight bias is attributed to the instinctive need to find order in the world by creating rationalizations that allow individuals to believe that events are predictable. Finding invalid links between the cause and effect of an event may result in incorrect over generalizations.

The gambler's fallacy refers to an incorrect interpretation of statistics where an individual believes that the occurrence of a random independent event would by some means cause another random independent event less likely to happen. Some investors may believe that they should sell a stock after the price has gone up in a series of subsequent trading sessions because they do not believe that the stock is likely to continue to increase in value. Alternatively, other investors might hold on to a stock that has fallen in multiple sessions because they view further declines as unlikely. If a stock has gone up on six consecutive trading sessions, it does not guarantee that it is less likely to go up during the next session.

Herd behavior represents the preference for individuals to imitate the behaviors or actions of a larger sized group. Reasons why herd behavior occurs is due to the social pressure of conformity and the common rationale that it is unlikely that a large group could be wrong. Most people are very sociable and have a natural desire to be accepted by a group, rather than be labeled as an outsider. So, following the

group is the best way of becoming a member. On the other hand, even if someone is convinced that a particular idea or course of action is irrational or incorrect, that individual may still follow the herd, believing they know something that others do not. This is especially common in situations in which an individual has very little experience.

Overconfidence represents the tendency for an investor to overestimate his or her ability in performing some action. There is a fine line between confidence and overconfidence. Confidence involves realistically trusting in someone's abilities, while overconfidence usually means an overly optimistic assessment of someone's knowledge or control over a situation. Overconfidence can also be damaging to an individual's stock picking proficiency in the long run. Overconfident investors tend to conduct more trades than their less-confident peers.

Overreaction and availability bias occurs when an individual reacts to a piece of news in a way that is greater than the actual impact of the news. Investors in the stock market predictably overreact to new information, creating a greater than expected effect on a security's price. This surge in price is not a lasting trend even though the price change is typically sudden and substantial, the surge declines over time. Individuals tend to heavily assess their decisions toward more recent information, making any new opinion biased toward that latest news.

Prospect theory refers to an idea created by Drs. Daniel Kahneman and Amos Tversky that determined how people do not program equal levels of joy and pain to the same effect. Individuals tend to value gains and losses differently and will base decisions on apparent gains rather than apparent losses. If an individual was given two equal choices, one expressed in terms of possible gains and the other in possible losses, they would choose the former even when they would achieve the same economic end result. The average individual tends to be more loss sensitive, as losses have more of an emotional impact than an equivalent amount of gains.

In Daniel Kahneman's book, Thinking, Fast and Slow, the way that people think, react, and reach conclusions in all areas are a part of the predictable ways that errors of judgment occur are discussed (Kahneman, 2011). The architecture of human decision-making is included and the historical data of people's systematic mistakes and irrational patterns. Some examples covered are 1. Framing. Subjects assessed are more likely to opt for surgery if told that the survival rate is 90 percent, rather than that the mortality rate is 10 percent. 2. The sunk-cost fallacy. Subjects try to avoid feelings of regret; they invest more money and time in a project with uncertain results rather than give it up and admit they were wrong. 3. Loss aversion. In experiments, most subjects would prefer to receive a sure \$46 than have a 50 percent chance of making \$100.

### CONDITIONS OF RETIREMENT INCOME

The United States' retirement system is often symbolically referred to as the three-legged stool supporting retired workers. The legs of this symbolic stool are Social Security, employment-based pensions and personal savings and asset income. Retirement wealth income is primarily in the form of

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Social Security, pensions and home equity. Americans need a secure financial outlook plan in order to establish the necessary resources needed for retirement. With the threat of reductions in Social Security, Medicare, pensions and retiree health insurance, and longer life expectancies, individuals need to be educated on both retirement wealth accumulation and how to make savings last for a lifetime.

The government has been involved in trying to manage the issue of Americans not saving enough for retirement by offering tax-related incentives and education (CTS ASEC, 2005). Individuals can plan for their retirement financial security by starting to save early and continue this practice each year. It is not always about how much a person saves but more of the fact that they do save and allow their money to grow over time. Saving is one of the most important choices someone can ever make to protect their future. The earlier someone starts to save, they will be able to prepare the way for future home ownership, their children's education, a secure family lifestyle, a comfortable retirement and many other opportunities as they strive for success, health and happiness.

Employers have more of an interest in promoting savings and retirement planning than ever before to their employees. Many people have the opportunity to save through employer-sponsored retirement plans. Some companies still have traditional employer-sponsored defined benefit (DB) pension plans. Many more employers sponsor defined contribution (DC) plans, a plan that allows employees to choose their own investments from a variety of investment options while more of the responsibility for retirement savings is falling on workers. Some employers match employees' contributions which enables their retirement savings to accumulate even faster. The 401(k) is widely offered by private corporations. Similar retirement plans are offered by nonprofit employees to save on a tax-deferred basis. The money that they contribute to a DC plan is deducted from their pre-tax gross income.

Employer sponsored plans are not the only tax-deferred savings options. The traditional individual retirement account (IRA) offers tax-deductible contributions for qualifying savers, and the Roth IRA allows an individual's money to grow tax-free under certain circumstances. In order to maximize retirement savings, people should save often and as much as they can afford, this would put them more ahead of the game if they are able to invest in an IRA after they have contributed the maximum to their employer sponsored plan.

In addition to an employer sponsored plan or an IRA, someone can invest directly in individual stocks or bonds. Due to the difficulty for even the most skilled investors to research and sift through thousands of choices of stocks and bonds, many people opt for mutual funds instead.

#### **RETIREMENT SAVINGS ASSESSMENT**

The average life expectancy has risen dramatically during the last century (Gillespie, 2012). The U.S. Census Bureau estimates that the number of centenarians, people who live to be 100, rose from 2,300 in 1950 to nearly 80,000 in 2010, and will exceed 600,000 by 2050. Also, according to the Society of

Actuaries, a 65 year old couple now has a 31 percent chance of at least one spouse living past the age of 95.

Based on the results of a survey from Merrill Lynch, 58 percent of affluent Americans have a positive view of the prospect of living to be 100 (DiCenzo, 2007). Although, three out of four would approach their money management differently if they knew today that they were going to live that long. A few things they would consider are continuing to work part-time during retirement (39 percent), investing in an annuity (32 percent), contributing more to a savings vehicle (32 percent) and retiring closer to 85 rather than 65 (25 percent). The majority of respondents (59 percent) also believe that the age at which Americans are eligible to collect Social Security should be raised.

Behavioral finance research has made important, relevant contributions to retirement saving and investing. This research displays an innovative perspective on participant behavior and its basis. Individuals tend to be passive with good intentions, poor follow-through, and restricted rationality. Loss aversion and decision making biases often lead to unfortunate outcomes, including a poorly funded retirement.

Behavioral finance analysts have demonstrated that education and communication programs alone may not be effective in changing behavior. However, with behavioral insights, they have offered new retirement plan design alternatives and tested their effectiveness in overcoming identified adverse behavior. These efforts are helping to pave a way of least resistance that should lead to better retirement security.

The Pension Protection Act (PPA) of 2006 supports these alternatives by providing incentives to plan sponsors that implement automatic features such as automatic enrollment and deferral rate escalation. It also allows plan sponsors to choose more aggressive investment defaults.

### DATA ANALYSIS

An increasing number of the retirement planning tools and philosophies that are widely used to answer the question of whether someone has enough for retirement, or if they will live longer than their money often give misleading results (Milevsky, 2011). More problematically, the individual then generates a false sense of security that they definitely do have enough, when in fact they do not.

Assume a person is 65 years old and would like to retire today. Besides the entitled income from government and employer-based pensions, assume that the person will need an additional cash flow of \$1,000 per month (\$12,000 per year) for the rest of their life. If someone is retiring at the age of 65 and would like a \$1,000 monthly income stream until life expectancy, which is age 84.2, and this money is invested at a real interest rate of 1.5percent, then the individual will need a nest egg of a little over \$200,000 at retirement. The real interest rate of 1.5 percent is selected as the investment return, since it is the best rate that can actually be guaranteed in today's environment on an after-inflation basis. In late July 2011, long-term inflation-linked (government) bonds are yielding 1.5 percent.

Assuming a more aggressive rate of return and then claiming that retirement has suddenly become cheaper is a dangerous myth that will end up costing many retirees a lot more. More importantly, a life annuity should not be viewed as just another expensive way to finance retirement income or as just one possible tool in a growing collection of products. Relatively, the annuity price is actually a market signal of what retirement really costs. And, it is the cheapest and safest way to convert a nest egg into a lifetime of secure income. Market prices convey information and the cost of a life annuity is a hard-drive full of intelligence. A nest egg is a particular amount of money saved or invested for one specific future purpose such as retirement, education or entertainment. The main purpose is that the money in the nest egg should not be used except for the purpose for which it is saved. The real dilemma is what fraction of the nest egg someone would really want to allocate to actual retirement and eventually convert into some sort of life annuity. Also, determining what fraction of that nest egg should be allocated to the kids, the grandkids and beyond, maybe using life insurance and other estate transfer products. This is obviously a personal decision that has less to do with expected returns and probabilities and everything to do with personal preferences.

From 1974 through 1999, there has been a steady increase in the percentage of individuals aged 65 and over receiving employment-based pensions and annuities (EBRI, 2011). From 2000 through 2010, that percentage fluctuated from 34.3 percent to 35.4 percent. The Employee Benefit Research Institute (EBRI) tabulations of the Current Population Survey (CPS) show that in 1974, only about one-quarter of retirees received income from employment-based pensions and annuities and in 2010, over one-third were receiving retirement income from this source. With pensions and annuities including a 5.7 percentage points more of total retirement income in 2010 than in 1974, this leg of the retirement stool is supporting a greater proportion of retired workers' incomes. The predictions assume both nearly total rollovers of pension savings upon job change as well as total annuitization of pension savings upon retirement. Both assumptions are unlikely to hold 100 percent true in reality and based on the results in Chart 3 it suggests that the future of retirement income, both Social Security and employment-based pensions will continue to cover a smaller percentage of retirees than today.

Persons aged 65 and over, in the highest income quintile, are most likely to receive income from earnings, assets, and employment-based pensions and annuities (Figure 4) (Helman, Greenwald & Assoc., Copeland and VanDerhei, 2011). Their equivalents in the lowest two income quintiles are least likely to receive income from these sources. Additionally, those in the lowest two income quintiles depend mostly on Social Security, which comprises almost 88.5 percent and 88.8 percent respectively of their incomes, in 2010. In comparison, persons aged 65 and over in the second highest income quintile receive, on average, about half of their income from Social Security, and persons in the highest quintile receive about one-fifth of their retirement income from this source.



**Figure 4**: Income from Social Security as a Percentage of Total Income Among Individuals Age 65 and Over, by Income Quintile, 1975-2010

Source: EBRI estimates of data from the Current Population Survey, March 1976-2011 Supplements.

The total U.S. retirement assets were \$17.9 trillion as of December 31, 2011, which is up 4.9 percent in the fourth quarter of 2011 and unchanged for the year (Figure 5) (ICI, 2012). Retirement savings accounted for 36 percent of all household financial assets in the U.S. at the end of 2011. Assets in individual retirement accounts (IRAs) totaled \$4.9 trillion at the end of 2011, an increase of 4.6 percent from the end of the third quarter of 2011. Defined contribution (DC) plan assets rose 4.8 percent in the fourth quarter to \$4.5 trillion. Government pension plans, including federal, state, and local government plans, held \$4.5 trillion in assets at the end of 2011 which is up 6.6 percent from the end of the third quarter of 2011. Private-sector defined benefit (DB) plans held \$2.4 trillion in assets at the end of the fourth quarter of 2011, and annuity reserves outside of retirement accounts accounted for another \$1.6 trillion.

### CONCLUSION

The government has estimated that it will lose \$136 billion this year in revenue to tax-deferred retirement plans (Greene, 2012). Congress proposed an amendment to the bill to reduce retirement plan tax benefits. This proposal is intended to increase tax revenue and retirement savings. Under current 401(k) rules, the combined employee and employer contributions for 2012 cannot exceed \$50,000. Under the proposed change, the 20/20 proposal, the combined employee and empl

limited to 20 percent of the employee's compensation with a maximum of \$20,000. IRAs would be created that would automatically enroll workers with no access to a workplace retirement plan by creating a way for them to save through regular payroll deductions. The replacement of exclusions and deductions for retirement savings with an 18 percent tax credit that would be deposited into the individual's retirement savings account. To accelerate the automatic enrollment of workers in retirement savings plans, simultaneous with their default savings rate, and automatically increasing workers' savings rates each year.

If this amendment were to be passed, it will have a significant effect on the way in which Americans currently save for retirement. The elimination of the tax-deferred benefit could cause workers to decrease the amount that they defer or force them to discontinue their contributions all together. Employers would also be affected by this proposal and may decide to cease the offering of a 401(k) plan. Retirement options need to be improved and expanded through further planning, financial education and investment advice. This will enable workers to plan for retirement at a sensible age and make good decisions in difficult economic times. There also needs to be a new innovative way to provide guaranteed retirement income for all workers in the U.S. based on their life expectancy to insure that their savings do not run out.

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# Money Market Mutual Funds: Fund Structure and Regulatory Reform

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### ABSTRACT

Money Market Mutual Funds, originally designed as a safe channel for investors' money, experienced staggering industry-wide withdrawals during the economic downturn of 2008. In order to prevent Money Market runs, regulatory action is necessary. Following the regulatory structure in the banking industry, this paper empirically examines the possibility and effectiveness of employing two regulatory approaches, an industry-wide insurance system and a fund-level risk monitoring system, in the Money Market industry.

### I. INTRODUCTION

During the financial crisis of 2008, Money Market Mutual Funds (MMMFs) experienced huge net outflows, adding risk to the already turbulent financial markets. Faced with unprecedented demands for redemption, MMMFs sold assets at the equivalent of fire sale prices. Not fully appreciating that MMMFs can, and do in fact, lose value, investors lost confidence in these funds, as well as in other financial instruments. Markets were in great turmoil and the stock market lost a significant portion of its value. During this crisis of confidence, the Securities and Exchange Commission (SEC) intervened to stem the fears of the investing public and reduce the demand for MMMF redemptions. This intervention resulted in a relative stabilization of the MMMF industry. Despite this relative stabilization, its reflection on MMMFs increased the need for American investors to better understand the MMMF industry and its risk structure.

This paper strives to identify the fragileness of the MMMF industry through a comparison of its structure with that of the banking industry. Banks risks are regulated in two ways: bank specific regulations and industry-wide safety nets. The regulator has identified specific capital requirements for individual banks in order to maintain their ability to meet redemptions. Additionally, the Federal Deposit Insurance Corporation (FDIC) was established to ensure the safety of depositors' money. A similar structural investigation in the MMMF industry will help monitor the risk of MMMFs, thus enhancing the incentives to invest in MMMFs.

The paper is organized as follows. The next two sections provide a review on the MMMF industry and a discussion on the risk structure of MMMFs. Section four presents the methodologies and discusses the test results. The final section concludes the paper.

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### II. AN OVERVIEW ON MONEY MARKET MUTUAL FUND INDUSTRY

MMMFs provide both retail and institutional investors a low risk way to receive the benefits of pooled investing. Since the inception of the industry in 1971, MMMFs have been economically important because they serve as the intermediary between investors who desire a liquid investment and borrowers who seek short term capital. Usually perceived as low-risk investments, MMMFs are classified into three distinct market segments: Prime MMMFs, Government MMMFs, and Tax Free MMMFs. Prime MMMFs invest mainly in private debt instruments such as commercial papers, certificates of deposit, and variable rate demand notes. Compared to Government and Tax-Free MMMFs, Prime MMMFs typically offer the highest yield and generally have the most Assets Under Management (AUM). As of January 1st, 2011, Prime MMMFs held \$1.79 trillion in AUM, representing 55% of the entire MMMF industry.

MMMFs in the United States are required to have a rounded Net-Asset-Value (NAV) of \$1.00 per share. The NAV is calculated by dividing the total value of the fund's portfolio, less its liabilities, by the total number of shares outstanding. The NAV remains a steady \$1.00 per share, despite gains and losses in the fund, by adjusting the number of shares held by investors. When a fund's assets increase in value, investors receive a corresponding adjustment in their number of shares, allowing the NAV to remain at \$1.00. In contrast, if an investor redeems her shares, the decrease in the number of shares in the fund is matched by an equivalent decrease in assets held by the fund (as her shares are redeemed at \$1.00 per share), resulting in an unchanged NAV of \$1.00 per share. It is important to note, however, that the NAV is rounded to the nearest cent and thus may fall as far as \$0.995 before the fund 'breaks the buck.' When a fund 'breaks the buck,' it means the fund's NAV has fallen below \$1.00. This can happen when the fund's investors' concerns and fears lead them to demand redemptions and seek more secure investments, resulting in net outflows from MMMFs.

Despite its perceived safety, the MMMF industry is inherently susceptible to runs. MMMF investments are structured to allow for instantaneous purchase or redemption from the fund. When a large number of investors seek to redeem their MMMF investments suddenly and simultaneously, it is nearly impossible for the fund to meet all redemptions. Furthermore, MMMFs are not insured nor are fund sponsors formally obligated to support the funds in an emergency. Consequently, if a fund is 'breaking the buck,' there is an incentive for investors to redeem ahead of their peer investors, as investors are afraid that the fund may not be able to meet all investor redemptions (Collins and Mack, 1994).

MMMFs also have structural shortcomings that are compounded by investor culture. The NAV promotes a false sense of security to investors. Since the NAV is rounded and investors do not see regular gains and losses on their investments, MMMFs are often mistakenly considered to be risk free. Moreover, as MMMFs are not high yield investment vehicles, they appeal to risk-averse investors who may be sensitive to the slightest chance of a negative market event. Evidence during the market downturn of 2008 shows that MMMF investors redeem and move their money into more secure investments when there is any indication of trouble in the MMMF industry. For example, when the President of Federal Reserve Bank of Boston Eric

Rosengren gave a speech on June 3, 2011, citing MMMFs as a source of financial instability, Prime MMMFs' AUM decreased by over 3% of total AUM, or \$4 billion during the following two weeks. Furthermore, when the *Wall Street Journal* published "Money Market Mayhem" on June 27, 2011, an article highlighting MMMFs' exposure to struggling European nations, Prime MMMF AUM fell by 2%, or \$2.5 billion, in one week. Lastly, when the Financial Stability Oversight Committee (FSOC) released its report on July 26, 2011, in which MMMFs were identified as an area of concern, Prime MMMF AUM decreased by \$5.4 billion, representing over 4% of total Prime AUM (iMoneyNet data). As supported in the aforementioned examples, the success of money market mutual funds is significantly dependent upon the actions of investors, who tend to be conservative but frequently respond abruptly via redemptions when concerned about the safety of their investments.

### III. MONEY MARKET MUTUAL FUNDS IN THE GLOBAL FINANCIAL CRISIS

Despite the structural instability of MMMFs, as of August 2008, AUM totaled \$3.5 trillion and the Weighted Average Yield (WAY) for all MMMFs was over 2% (iMoneyNet data). However, when Lehman Brothers failed on September 15, 2008, investors were concerned about the Reserve Primary Fund, a large MMMF that held significant exposure to Lehman Brothers. Not surprisingly, investors redeemed shares in massive and sudden fashion. At the same period, over a four-day period from September 15 to 19, 2008, Prime MMMFs lost over \$300 billion in AUM (iMoneyNet data). As a result, MMMFs were forced to sell assets in an attempt to meet abrupt demand for redemptions.

Unfortunately, some assets proved more difficult to sell. The spreads on Asset-Backed Commercial Paper (ABCP) increased significantly and investors shunned longer-term securities. This situation resulted in ABCP to be issued only in overnight maturities, and the resulting effects on the short-term credit market were severe. Businesses across many industries, which traditionally relied on short-term funding from MMMFs, suffered from this lack of liquidity.

In an effort to soothe the concerns of MMMF investors, the government intervened. On September 19, 2008, the United States Treasury issued a temporary guarantee on MMMFs (Anderson and Gascon, 2009). The program was intended to slow the run on MMMFs by assuring investors their money would be safe. Additionally, the Federal Reserve Bank created the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF). The AMLF provided funding, in the form of loans, to banks and bank holding companies to purchase high quality, eligible ABCP from MMMFs at no risk of loss. In tandem, the two immediate interventions helped slow the run on MMMFs and restore the short-term funding markets. The temporary guarantee by the Treasury ended nearly one year later, on September 18, 2009; the AMLF ended on February 1, 2010.

Although effective in the short term, both the Treasury Temporary Guarantee Program and the Federal Reserve AMLF were inadequate remedies to MMMF industry's structural flaws. On January 27, 2010, the SEC passed 2a7, an amendment to the Investment Act of 1940 that addressed many of the MMMF industry structural deficiencies (Agapova, 2011). In an effort to address concerns over a fund's ability to meet sudden

redemption requests, SEC 2a7 regulations mandate that a MMMF maintain a daily liquidity position of 10%, and a weekly liquidity position of 30%. These restrictions are intended to provide MMMFs a liquidity cushion large enough to avoid the forced selling of assets in unfavorable markets. The SEC intervention resulted in improvement of MMMF portfolios by stipulating that a taxable MMMF may not invest more that 3% of its portfolio in second-tier securities or hold a single second-tier security exposure larger than 0.5%. These regulatory changes are expected to reduce the likelihood that a fund would break the buck because of a single credit event. Furthermore, in an effort to address interest rate risk, the SEC amended certain regulations regarding portfolio maturity. Specifically, a portfolio may not have a Weighted Average Maturity (WAM) over 60 days, increasing the previous WAM restrictions of 90 days. The SEC also adopted a rule change now permitting MMMFs at risk of "breaking the buck" to suspend redemptions until the fund can liquidate its portfolio in an orderly manner, thus avoiding the risk of further depressing market valuations through liquidation at fire sale prices.

As a consequence to the events of 2008, MMMF problems are no longer overlooked. Further reform to the MMMF industry is foreseeable. Before any possible regulatory options are implemented, it is necessary to understand the forces that drive investors' action in Prime MMMFs. This paper strives to identify the major forces in MMMF industry by following the regulatory principles in the banking industry. Commercial banks typically offer very low interest rates to depositors and similarly to MMMFs are considered one of the safest cash holding vehicles available. Nevertheless, there have been periods throughout history in which investors lacked confidence in banks' ability to meet their redemptions, leading to a run on the industry. However, with improved regulatory standards and the introduction of the FDIC in 1933, the likelihood of runs on banking institutions has lessened significantly. The FDIC was established in response to a series of bank failures during the 1920s and 1930s. The FDIC insures deposits in the United States against bank failure, inspires public confidence in the commercial banking industry, and helps maintain stability in the financial system. Together, the establishment of capital reserve requirements and the FDIC has improved the safety of the commercial banking industry (Schaeck, 2008). Following the two-layer regulatory intervention applied in the banking industry, this paper analyzes how fund performance and investor activities change in the MMMF industry with respect to factors in two major groups - fund specific factors and industry wide factors - to provide empirical evidence to support possible regulatory proposals.

### **IV. EMPIRICAL TESTS**

From January 2007 to December 2009, the U. S. economy experienced booming economic growth, suffered its worst recession in the last eighty years, and entered a period of slow economic recovery. These time segments are tested during this 36-month period, and the fund-specific as well as industry-wide factors' effects on Prime MMMF AUM are analyzed.

The data used in this study are retrieved from imoneynet.com. Table 1 describes the variables that may influence the size of AUM as they appear in the regression models. The six explanatory variables can be divided into three groups. The first group includes factors that influence the risk level of a specific fund,

Weighted Average Maturity in days (WAM) and percentage of holding that is maturing in 7 days (MATin7days). The WAM factor is expected to have a positive relationship whereas MATin7days is expected to have a negative relationship with AUM, because the longer the maturity, the higher the risk, and correspondingly the higher the expected return of the fund. As a consequence, higher expected return is expected to attract more assets in-flows. The second group includes factors that influence the risk of MMMFs at the industry level. VIX, the Chicago Board Options Exchange Volatility Index, is the widely used proxy to reflect the uncertainty of the overall market. Treasury Eurodollar Spread (TEDspread), calculated as the spread between Eurodollar and T-bill, is a variable usually used to reflect credit risk level in financial markets. Fund performance variables are the last group. We include Fund Management Fee (MGTfee) and Simple Daily Yield (DAYnet). It is expected that the higher the return, or Simple Daily Yield (DAYnet), and the lower the Fund Management Fee (MGTfee), the more likely the fund will attract more assets in-flows. The definitions of the variables are shown in Table 1.

Variable Name	Definition
AUM	Assets Under Management (in million US dollars)
MGTfee	Fund Management Fee (%)
DAYnet	Simple Daily Yield (%)
WAM	Weighted Average Maturity (in days)
MATin7days	Percentage of Holding Maturing in 7 days
VIX	Chicago Board Options Exchange Volatility Index
TEDspread	Treasury Eurodollar Spread (%)

## Table 1: Definitions of Variables

We use panel data to identify which factors among the six independent variables are significant in relationship to AUM through the whole study period (Table 2). The test results show that every factor except TEDspread in the model is statistically significant. The signs of the coefficients are as expected as well. Management Fees (MGTfee) contributes negatively to AUM; that is, the higher a fund's expense ratio, the less investment money the fund is likely to attract. Daily Simple Yields (DAYnet) contributes positively to AUM, meaning that when investors receive a higher return on their money from a fund, they are more likely to invest with that fund. Weighted Average Maturity (WAM), a measure of a fund's risk appetite, positively affects AUM. As a fund takes on more risk, by increasing WAM, AUM rises. The percent of securities maturing in 7 days (MATin7days) operates consistently with the WAM. That is, as MATin7days decreases, WAM increases accordingly. Therefore, the negative significant influence of MATin7days is consistent with the findings related to WAM. A rising VIX indicates a more volatile market. As demonstrated in Table 2, VIX is positive significant, indicating that as the market becomes more volatile, investors will shift assets into

MMMFs. This reflects the general perception on MMMFs as safe investment vehicles. The full model does not indicate any significant influence from TEDspread. This can be explained by the high correlation, with a  $\rho$ =0.718, between VIX and TEDspread. A multicollinearity problem may exist because of the high correlation between the two factors. So in the following tests, we separate the two market factors to test their explanatory power respectively.

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Variable	Coef.	Std. Err.	z value	Pr > z	
intercept	1076.40***	352.70	3.05	0.002	
MGTfee	-9565.80***	352.05	-27.17	0.000	
DAYnet	149.10***	30.53	4.88	0.000	
WAM	77.76***	4.49	17.30	0.000	
MATin7days	-1232.28***	371.94	-3.31	0.001	
VIX	19.15**	7.55	2.54	0.011	
TEDspread	-21.93	84.75	-0.26	0.796	

**Table 2:** Full Model of GLS Regression Based on the Whole Study Period

\*\* significant at the 5% level; \*\*\* significant at the 1% level

Rsq=0.043

N=25012

Since there was a dramatic outflow of assets in Prime MMMFs during the period of economic downturn between July 2008 and June 2009, we then divide the dataset into two subsets: One covers the period from July 2008 to June 2009 to reflect the assets flow in abnormal economic situation, and the other covers other months, including the periods from January 2007 to June 2008 and then from July 2009 to December 2009 to reflect the assets flow in normal period. Tables 3A and Table 3B show the results during normal period. We include only one of the two macro factors, VIX or TEDspread, in each test to separately examine the contributions of market volatility and credit risk.

As can be seen, the performance factors and fund level risk factors still demonstrate similar influences to assets flow as shown in the pooled dataset. For the market factors, when only TEDspread is included, the test results reveal that TEDspread is not significant with a *p*-value of 0.11, indicating that AUM of Prime MMMFs is not very sensitive to the changes of TEDspread during normal economic periods. On the other hand, AUM is highly sensitive to the changes of VIX during this period.

	e regreeelen aa	ing Honnar i ol		
Variable	Coef.	Std. Err.	z value	Pr > z
intercept	1343.25***	378.68	3.55	0.000
MGTfee	9375.43***	408.14	-22.97	0.000
DAYnet	115.42***	32.01	3.61	0.000
WAM	76.27***	5.62	13.57	0.000
MATin7days	1044.91**	452.54	-2.31	0.021
TEDspread	166.41	104.26	1.60	0.110
-				

Table 34: GLS	Regression	during Normal	Periods with	VIX Dropped in M	odel
Table JA. OLO	regression	uuning Normai		VIX Dropped in N	ouer

N= 16971 Rsq=0.042 \*\* significant at the 5% level; \*\*\* significant at the 1% level

Variable	Coef.	Std. Err.	z value	Pr > z	
intercept	293.25	525.71	0.56	0.577	
MGTfee	9330.70***	408.31	-22.85	0.000	
DAYnet	168.18***	34.53	4.87	0.000	
WAM	75.81***	5.61	13.50	0.000	
MATin7days	-1076.91**	452.20	-2.38	0.017	
VIX	49.02***	15.40	3.18	0.001	

N=16971Rsq=0.042\*\* significant at the 5% level; \*\*\* significant at the 1% level

Table 4A: GLS Regression	during Abnormal Periods with	VIX Dropped in Model

Table 4A. GLC	3 IVEGIESSION duni	iy Abriornal F	enous with vix	Diopped in M	oue
Variable	Coef.	Std. Err.	z value	Pr > z	
intercept	2150.20***	524.21	4.10	0.000	
mgtfee	-9191.69***	691.51	-13.29	0.000	
daynet	954.17***	140.54	6.79	0.000	
wam	72.94***	7.60	9.50	0.000	
matin7days	1276.30*	653.89	-1.95	0.051	
EDspread	-472.49***	117.09	-4.04	0.000	

N=8041Rsq=0.050\* significant at the 10% level ; \*\* significant at the 5% level; \*\*\* significant at the 1% level

Variable	Coef.	Std. Err.	z value	Pr > z		
intercept	3422.87***	652.16	5.25	0.000		
MGTfee	-9109.95***	692.02	-13.16	0.000		
DAYnet	1054.97***	146.88	7.18	0.000		
WAM	72.12***	7.63	9.45	0.000		
MATin7days	-1309.82**	653.43	-2.00	0.045		
VIX	-56.41***	12.11	-4.66	0.000		
N=8041	Rsq=0.051					

**Table 4B**: GLS Regression during Abnormal Periods with TEDspread Dropped in Model

\*\* significant at the 5% level; \*\*\* significant at the 1% level

Tables 4A and 4B show the results for the period of economic downturn. Both VIX and TEDspread demonstrate significant negative contribution to AUM, indicating that during the abnormal market period, investors will redeem more shares from MMMFs when there is an increase in volatility of the market and credit risk, a phenomenon that is opposite to what happens during normal economic periods.

The industry-wide examination is intended to identify external market indices that the MMMF industry, as a whole, can use to hedge against and in turn offset systematic risk. The above results indicate that both VIX and TEDspread have a very close negative relationship with the asset flows of MMMFs during abnormal economic downturn, while during normal economic periods, VIX has significant positive impact to asset flows and TEDspread does not demonstrate significant relationship with asset flows. Since MMMFs are considered to be safer investment vehicles, an increase in asset in-flows to MMMFs due to the increase of market volatility during normal economic periods is an action that is not likely to trigger fund runs. As a result, risk hedging for MMMF industry is not necessary during normal economic periods. It is only during the abnormal economic period that risk hedging for the industry becomes important. Our test results indicate that between the two market variables, VIX and TEDspread, TEDspread is a better index to hedge the systematic risk in MMMF industry, because asset flows are only sensitive to TEDspread during abnormal periods and not sensitive during normal periods.

More specifically, since TEDspread is the spread between T-bill and Eurodollar, if a reserve fund is to be used to hedge against the risk of overall industry, the reserve fund can long T-bill and short Eurodollar futures contracts. As a result, when credit risk increases during abnormal economic downturn, TEDspread increases and money flows out of money markets; this outflow will be offset by the increases in value of the reserve fund as the result of hedging.

The above analysis demonstrates the viability and applicability of an industry-wide insurance system. The reserve fund outlined above will serve as a form of insurance. In an abnormal economic situation, the reserve fund will serve as a liquidity buffer, because its value is expected to increase due to hedging; whereas in a normal economic situation, the value of the reserve fund is not going to change dramatically.

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Next we further examine the relationship between fund maturity and AUM in depth. We plot WAM, measured in days, against changes in MMMFs' AUM.<sup>1</sup> While not conclusive, a cursory analysis of the plots indicates that AUM, and in turn investor behavior, is significantly more volatile when WAM increases over 40 days. Most of the dramatic changes in AUM occurred between the range of a WAM of 40 days to 60 days.

The specific reason that causes this phenomenon deserves further investigation. However, we can tell from this result that if a fund-level risk monitoring process is to be employed, a WAM of 40 days can be the cut-off point for stricter monitoring actions. This result indicates that the aforementioned regulation restricting a portfolio from having a WAM over 60 days may not be adequate, because our plots between AUM and WAM indicate that most of the dramatic changes in AUM happened in funds with a WAM from 40 days to 60 days.

### V. Conclusion and Further Inquiry

The MMMF industry is not as safe as regulating agencies and the investing public perceive it to be. Underscored by the events in the financial crises of 2008 is the important role that MMMFs play in maintaining financial stability in the United States economy. The regulatory structure of MMMFs, then, could be a source of financial instability. This paper examines and identifies a regulatory recommendation to mitigate the chance of a run on MMMFs, and in turn a major market event in the economy. This paper's analysis lends itself to a regulatory recommendation similar to the structure of bank regulation, on fund-specific and industry-wide level: applying stricter monitoring process for funds with Weighted Average Maturity over 40 days, and creating a reserve fund to long T-bill and short Eurodollar future contracts. Together, the fund-specific and industry-wide recommendations will provide a regulatory framework that will help mitigate the risk of Money Market Mutual Funds, while maintaining the incentives to invest in Money Market Mutual Funds.

Despite the significance of the findings of this study, there remains considerable opportunity for further research. As illustrated in previous sections, this paper strives to empirically test the viability of employing a dual-pronged regulatory structure. The individual fund level regulatory evaluation indicates that as the Weighted Average Maturity increases to over 40 days, MMMF Assets Under Management become much more volatile. However, this observation is not sufficient for identifying the underlying reasons that cause the phenomenon. Developing a clear understanding of causes is necessary to support a regulatory recommendation. While the analysis of this paper identifies a very important opportunity for regulators, it does not address the interconnectedness of factors, highlighting the gaps where further research is needed

### **ENDNOTE**

1. The plot results are available from the authors upon request.

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