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Table of Contents

Excelsior Scholarship Program: Public/Private Enrollment and College Financial Stability

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ABSTRACT

The New York State Excelsior program, approved and started in 2018, promised to provide NY state residents with family income below a threshold of $125,000 ($100,000 in the first year of inception and eventually rising to the higher level) up to the full cost of tuition (dependent upon the full range of financial assistance that a student is awarded) for attendance at state supported two and four year colleges and universities (SUNY and CUNY). This paper is an exploratory evaluation of the impact the Excelsior program on colleges and universities within the state and the implications on both the enrollment patterns of in-state students, the financial health of higher education institutions in the state, and upon state economic growth.

1. INTRODUCTION

The introduction of the Excelsior Scholarship program in New York in 2017 is in part a response to the calls and proposals for free higher education that were discussed during the previous year's presidential elections. While the program is not exactly free higher education for all, it will potentially provide significant support for students in NY state that are planning on attending SUNY and CUNY two and four-year colleges and universities, and state supported specialized programs. The program is administered as a last-dollar tuition scholarship, meaning that students must first exhaust all other financial aid options such as Pell grants and other awards before Excelsior funding can be used. Though scholarship funding of this sort has been subject to criticism with regards to how well they actually support low-income students, analysts such as Goldrick-Rab and Miller-Adams (2018) and Abdil-Alim (2017) suggest that programs like Excelsior are helpful to these students and represent a good first-step towards innovating new models of making higher education accessible.

As reported by the popular press (Brody, 2017; Chen 2017) and NY's Higher Education Services Corporation (HESC), the Excelsior program offers NY residents attending or planning to attend state colleges and universities with family income of up to $125,000 annually ($100,000 in 2017, $110,000 in 2018, and eventually rising to $125,000) up to $5500 in tuition support (see Table 1). There are of course several conditions, the most notable include, recipients must be full-time students and complete at least 30 credits annually (fall, intersession, spring, and summer), a maximum of 4 years of support, and recipients that graduate must remain in NY State for the length of time equivalent to the number of years

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of support that they received. This last condition has drawn some of the greatest criticism as recipients may need to pass up good employment opportunities offers out of NY State after graduation (Brody 2017). Should the recipient fail to satisfy any of these conditions, the award converts into a loan that will need to be repaid.

Table 1: Excelsior Eligibility and policies
NYS resident for 12 continuous months prior to the beginning of the term and be a U.S. citizen or eligible non-citizen
Graduated from high school in the United States, earned a high school equivalency diploma, or passed a federally approved "Ability to Benefit" test
Have a combined federal adjusted gross income of $110,000 or less (rises up to $125,000)
Pursuing an undergraduate degree at a SUNY or CUNY college, including community colleges and the statutory colleges at Cornell University and Alfred University;
Enrolled in at least 12 credits per term and complete at least 30 credits each year (successively), applicable toward his or her degree program;
If attended college prior to the 2018-19 academic year, have earned at least 30 credits each year (successively), applicable toward his or her degree program prior to applying for an Excelsior Scholarship;
Be in a non-default status on a student loan made under any NYS or federal education loan program or on the repayment of any NYS award;
In compliance with the terms of the service condition(s) imposed by a NYS award that you have previously received; and
Execute a Contract agreeing to reside in NYS for the length of time the award was received, and, if employed during such time, be employed in NYS.
Tuition award up to $5500
A recipient of an Excelsior Scholarship is eligible to receive award payments for not more than two years of full-time undergraduate study in a program leading to an associate's degree or four years of full-time undergraduate study, or five years if the program of study normally requires five years, in a program leading to a bachelor's degree.
Source: HESC, https://www.hesc.ny.gov/pay-for-college/financial-aid/types-of-financial-aid/nys-grants-scholarships-awards/the-excelsior-scholarship.html

This paper explores some of the issues surrounding the Excelsior scholarship program and so-called “free tuition” programs. The program is only a year old at this point and there is limited data available for analysis. While it is not possible to provide a full empirical analysis of the issue and its impact on state operated and supported campuses, the available data is analyzed.

2. COLLEGE COSTS AND STUDENT AID

The value and cost of college are a source of continuing concern. While there are often reports in the popular press on the high cost of education and staggering level of debt that students are taking on in pursuit of a college degree, analysts such as Dynarski (2015, p.2) suggests that "… there is no debt crisis …. Rather there is a repayment crisis." Dynarski principal argument is that the returns to education are worth the investment despite the mismatch between when graduates begin to realize those higher returns and are thus better situated to pay off their loans and when they are required to start making payments on their student loans. Similarly, Webber (2016) finds that the present value of the returns to higher education range between $85,000 and $300,000 depending upon a student's major. Webber does cite two important risk factors that affect these outcomes – the risks associated with completing a college degree, and risks associate with finding employment.

Over the past thirty years, policy-makers across the country have responded to the issue of college costs and the need to respond to their constituents concerns by creating different types of financial aid programs including merit-based scholarship programs that provide support for a broad student population base. In general, many of these types of programs (such as Georgia's Hope Scholarship) require students to have and maintain a minimum grade point average to remain eligible. Studies such as those by Dee and Jackson (1999) looking specifically at Georgia's Hope Scholarship, which requires students to maintain a 3.0 GPA finds that fifty percent of all students lose their scholarship after their first year, and when compared to other fields, students in STEM based fields are more likely to lose their scholarships.

Page and Scott-Clayton (2016), in their analysis, distinguish between access, which is the focus of discussion of college costs, and college completion. Even if students gain admission to college and are participating in one of the various financial aid or (merit) scholarship programs that help to make college affordable, they still may need other types of nonfinancial support to complete their studies. Merit based scholarship programs only address one dimension of the issue.

Similarly, Dynarski (2000; 2003; 2008) found in her studies on the impact of aid on college attendance and completion, it is an important determinant. However even where students were provided free tuition, this did not result in universal completion rates, but it did increase the level of degree completion. Sjoquist and Winters (2015) found that merit aid programs did not have a discernable impact on either enrollment or completion. In a more recent study, Beneito, Bosca and Ferri (2018) found that higher college fees increased student academic effort.

Carruthers and Ozek (2016), in their analysis of Tennessee's Hope Scholarship program found that a student's loss of eligibility resulted in a discernable but small number of students dropping out of or becoming less engaged with their programs of study and more engaged with work. Barr's (2015) study found that the availability of programs such as merit aid programs like the Hope Scholarship resulted in a 6 percent reduction in the probability that someone would enlist in the military to take advantage of education benefits associated with service amongst financially constrained college age males. Carruthers and Fox's (2015) study of Knox Achieves, a forerunner to the Tennessee Promise program, found a

significant impact on high school completion and community college attendance. It should be noted that this program provides both a free tuition component as well as student support services.

While efforts to reduce college costs through free tuition models and broad-based merit aid programs have gained in popularity with the public and politicians, it is not clear from the literature how effective these programs are in providing either access or degree completion.

3. NEW YORK'S EXCELSIOR PROGRAM

Recent data from NY State (https://www.ny.gov/tuition-free-degree-program-excelsior-scholarship/regional-breakdown) indicates that out of just over 942 thousand resident families with college age students, 75.7 percent of the students from those households would potentially qualify for Excelsior. Enrollment figures for 2017-18 show that 391,416 students were enrolled in SUNY two and four-year undergraduate programs, and 244,420 in CUNY two and four-year undergraduate programs. Undergraduate enrollment across all private and public institutions for 2017 totaled 999,174 total students part-time and full-time (http://www.highered.nysed.gov/oris/ORISReports1.html).

Based upon the data cited above, it would appear that participation in the Excelsior program would be fairly broad-based. Over 63 percent of all students studying in NY attend a SUNY or CUNY public institution. While student eligibility varies significantly across the state from a low of 55.6 percent for students from Long Island to a high of 84.8 percent in the state's North Country and New York City, only 3.2 percent of students across the state were able to participate in the Excelsior program last year (Hillard 2018). These disappointing figures for the 2017-18 academic year can likely be attributed to two factors:

- It was the first year of the program's existence and given the speed with which it was enacted and implemented left students little time to prepare or plan for the program, and
- Many students fell short of the required credit hours (30 credits annually).

Hillard (2018) reports that there were 63,599 applications for Excelsior, and only 20,086 applications were accepted.

In addition to the Excelsior program, resident students may be eligible for the Tuition Assistance Program (TAP) which can provide tuition support between $500 to $5165 towards tuition. Eligibility criteria for a TAP award requires that the student be a state resident with family income below $80,000 annually (dependent students). TAP awards can be used across a broad range of private, proprietary, and public institutions. However, it must be noted that students must also apply for TAP funding to take advantage of Excelsior funding. To remain eligible for TAP funding, students must maintain a 'C' average and be enrolled in at least 12 credit hours per semester.

4. TUITION COSTS IN NY STATE AND EXCELSIOR

Data from the Chronicle of Higher Education's 2018 Almanac reports that average tuition and fees at institutions in NY is $7618 annually for four-year public institutions, $39057 for four-year private

institutions, and $5130 for two-year public community colleges. Average tuition and fees for SUNY four-year institutions is $8480 and for CUNY institutions is $7190.

When Excelsior was introduced, it was reported in the popular press that many private institutions expressed concerns about how the "free tuition" plan may affect and impact enrollment at private institutions. While the figures above for private colleges and universities represent average tuition rates, before student living expenses, the cost of attending a private four-year institution is $32000 greater than a public institution. As a last dollar scholarship program, Excelsior is a program that works in addition to all other forms of financial aid that a student receives, and not an alternative form of financial aid.

As reported above, only 3.2 percent of public institution (two and four year) students qualified for Excelsior funding in its first year of operation. While this figure is likely to increase in the coming years as more families and students more fully incorporate the program into their planning horizon, it is not clear how much of a factor the free tuition component of public higher education will impact private school enrollment. What college a student should attend is based upon a range of factors. Cost is certainly an important factor, but not the only one. Students also select a school on factors such as program of study, location, reputation, sports programs, scholarships and financial aid awards.

5. CONCLUDING REMARKS

NY's Excelsior Scholarship builds upon the experiences of other states such as Arkansas, Georgia, and Tennessee and programs such as the HOPE Scholarship and Tennessee Promise. With a high family income eligibility range ($125,000), it appears to encompass a wide proportion of NY's student population. It is premised upon the idea that supporting and retaining a highly educated population will support state economic growth. The program is too new to effectively conduct any type of difference in difference, propensity score, or matching market design analysis to evaluate its impact on private and public college attendance. However, as more data becomes available, it will be possible to conduct some preliminary analysis on enrollment patterns between private and public institutions.

The program's goal of providing a skilled workforce to support state economic growth is laudable. However, the limitation on Excelsior recipients with respect to their mobility may create some issues for graduates. Many of SUNY's and CUNY's graduates already remain in the state and the NY metropolitan region. Many of the firms that employ SUNY and CUNY graduates may operate across various parts of NY state but also across state lines (the NY MSA for example encompasses parts of New Jersey, Connecticut and Pennsylvania). Despite its drawbacks though, Excelsior does provide additional support to NY residents towards college affordability.

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History of Machinery and Political Cartoons

Jacob Stenstrom

ABSTRACT

The introduction of the technological advances has, throughout history, been met with a reactionary force from the society it is introduced to. At its core societies heightened distaste of machines is a reflection of humanities interactions with the structure of capitalism. To understand the relationship between humanity and machinery, the medium of political cartoons is analyzed as a window into past and present tensions. The forces that separates humanity from its work already existed, but the introduction of new technology creates a greater acknowledgment of that separation.

INTRODUCTION

Today, people believe there exists the ever-looming specter of automation. The belief is that advancements in automation have allowed for machines to handle new forms of manual labor. The quality of machines has made machinery a lucrative investment. In many workplaces, machines have replaced the human labor force. In response a considerable amount of debate has occurred concerning the issue of automation. This debate, however, is predicated on a misinterpretation. The relationship between humanity and technology is not binary as the popular framing of the debate implies. It is a multifaceted relationship defined within a hierarchical structure based on the profit motive. The sociological effects of displacement reveals to worker's relationship with capitalist society.

An understanding about the perceived conflict between man and machine is expounded upon in the works of foundational figures in economics, Adam Smith and Karl Marx. Adam Smith (1955) directly derives the sociological pressure that draws people to these confrontational conclusions. Marx's work explains the capitalist structure generates societal tension and machine's role in creating said tension. To Marx, direct conflict does not exist between man and innovation, itself, but instead with the capitalist structure of the society, in which we live. These theories are shown to bear fruit when analyzing working people's concerns about technology throughout the ages.

Artistic expression acts as a conduit into the lives of previous and current generations. While the art form of political cartooning is relatively new, the use of cartoons as a visual tool originated during the industrial revolutions of America and England. The artwork created, therefore, provide unique insight into the people and issues of the time period. As the production of cartoons has remained prevalent to this day, comparison of different artwork from different time periods illustrates changing sentimentality concerning specific issues. With a combination of art history and economic theory, the perceived conflict

between man and machine can be deconstructed. The underlying tension of the man-machine dichotomy is merely a function of the hierarchical society of capitalism.

ECONOMIC THOUGHT

Historical Materialism states society is structured into two distinct categories, and then defines the influence one category has over the other. The first category is known as the substructure, while the second is the super structure. At the base of the theory, the substructure functions as the foundation, which influences the superstructure. The substructure is comprised of history, while the superstructure is comprised of ideas. In the model of historical materialism, history influences ideas. The conclusion, however, does not confirm the opposite.

The alienation of labor is one of Marx's (1997) most important principles. The environment defined by the profit motive creates degrees of separation throughout society. Within Capitalist society, there exists four distinct types of alienation. The first type of alienation is the alienation of man from product. The reason this form of alienation exists is workers do not own the product they make. The ownership of the product is taken from the workers by managers and executives, separating people from the result of the work they put in. The separation is an aspect of power dynamics, where the upper class displays overt control over the working class by being able to strip away the end product from the workers who created it. The second form of alienation is the alienation of man from process. This form of separation is the lack of control given to workers on how a task is completed. In any situation, workers lack true control over the production process. The third form of alienation is the alienation of man from man. The structure of capitalist society leads humanity to commodify the lives of other human beings. The quality of a life is now measured not in the value of humanity itself but instead in what that humanity is capable of producing. For the consumer, this alienation can come in the form of valuing the product and price of a good without ever considering the human value or cost. The general public focuses more on the quality of the final product and neglects to acknowledge the horrific conditions that were inflicted on workers to achieve the final product. For workers, commodification arrives in the form of competition. Competition for jobs and promotions, separates fellow workers from each other and forces them to think of their counterparts as adversaries in a fight for survival. Commodification separates humans from each other, making it harder to unite and connect with each other for a common cause. The attempt to separate man from each other works to further the power the capitalist class has over the lower classes. With less people in total, it is easier for the upper class to unite to hold onto their power, than it is for the lower classes to untie in an attempt to regain power. The final aspect, of the alienation of labor, is the alienation of man from species being. Species being is the aspects of life beyond the material realm. It consists of deeper thinking, introspection, and ability to engage with the world creatively. The inability for man to engage with these higher forms of interaction are a result of how work is structured. Workers are pushed into the position of working a considerable amount of time during the week, leaving them tired and with little time once the

work day is over. The situation leaves workers with only enough energy and time to fulfill their basic animalistic needs, such as eating, sleeping, and fraternizing. There is no time left in the day for workers to sit down and ponder deeper questions about themselves and the reality in which they exist. The separation forces workers into a more docile state of mind, without time or energy to question the structure that forces them into these conditions. Through the alienation of the working class from all aspects of society, the structure that works to suppress the working class can remain in place.

The overarching societal context of capitalist-working class power dynamics is not isolated to the thinking of Marx. Adam Smith (1955; Lamb, 1973), also, wrote extensively about the hurdles capitalist society puts in front of working class people. The origin of the conflict between the social classes is derived from economic causes. Smith views the class struggle as an evolving conflict where the capitalist class under most circumstances achieves victory. The struggle the working class faces is because of different societal factors that make it easier for the capitalist class to acquire and hold onto power. Firstly, the amount of wealth at the disposal of a member of the capitalist class vastly exceeds that of a working class individual. Access to this glut of wealth, allows for capitalists to hold out longer in an ongoing conflict. With large pools of wealth to pull from, the capitalist class has more available to lobby their case in the court of public opinion. Capitalists have access to a considerably wider range of resources. The final aspect that gives capitalists the advantage is numbers. The quantity of capitalists is fewer than that of working class people. With fewer people, it is easier to organize, plan, and accomplish a unified goal. These factors provide context to how the capitalist class is able to maintain the societal power dynamics Marx detailed.

HISTORICAL CONTEXT

One of the most significant instances where the relationship between man and machine concluded in violence is in the case of 19th century textile workers. Britain in the 19th century was undergoing an industrial revolution and part of that revolution was the introduction of new innovations into industry. The textile industry was effected significantly by the mechanical loom. Textile mill owners laid off a considerable amount of workers. The textile workers, who now saw their job as under siege by the new technology, would form a coalition of anti-machine revolutionaries, the Luddites (Watson 1993). The driving force for the Luddites was fear. The Luddites' beliefs play into the power dynamics that remain unchanged with or without a ban on machinery. The true separation from a more whole humanity is not the result of the inanimate objects that the Luddites fear. Instead, the Luddites fear is born out of a larger power system at play.

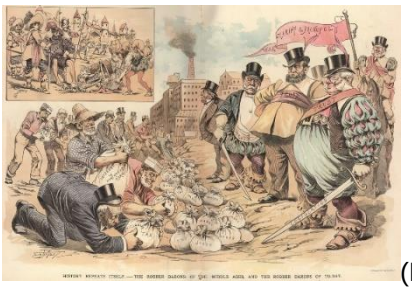
The American Progressive Era is an important historical milestone for both the history of political cartoons and the relationship between humanity and machinery. The tumultuous era began with the uncertainty of the 1893 banking crisis (Noyes, 1894). That uncertainty would only compound in the lives

of working Americans as the nation underwent intense industrialization, over the following two decades. The upper classes used the time period to consolidate economic and political power (Phillips, 1987; Brandeis, 1987).

The historical context of the time period spawned the modern political cartoon. The modern form of political cartoons is derived from the work of Progressive Era cartoonists (Lamb, 2004). The progressive era cartoonist originated as a result of the social strife created by the Progressive Era. Through the use of newspapers, cartoonists were able to reach a wide audience. While the working class of the Progressive Era had access to newspapers, that working class people did not necessarily have the skills required to engage with newspapers to their full extent. People of the time either lacked the ability to read English, or lacked the ability to read at all. Political cartoons circumvented the illiteracy issue. Regardless of educational and monetary background, everyone could engage with the visual messages conveyed in the cartoons. The opinions expressed by these cartoonists reflected the time period from which they originated from. Through looking at how cartoonists portrayed the relationship between man and machine, the artwork provides insight into the opinions of the time period.

CARTOONS

The theme of violence is prevalent in early renditions of political cartoons. The cartoons were primarily made in the late 19th century and focused on violence, primarily, as a defining aspect of oppression. In “History Repeats Itself: The Robber Barons of the Middle Ages and the Robber Barons of Today” (Edhardt, 1889) and “The Conditions of The Laboring Man at Pullman” (Unknown, 1894), the cartoons depict the capitalist class violently oppressing the working class. The main tool of said oppression is machinery. In “Conditions of the Laboring Man at Pullman”, the use of machinery as the tool of the oppressor is displayed literally. Pullman, a monopolist of the time period, uses a press to squeeze the life out of a worker. While the machine is used in a metaphorical sense to represent the monetary actions of Pullman, the machine itself represents an oppressive force. In “History Repeats Itself: The Robber Barons of the Middle Ages and the Robber Barons of Today”, the representation of machinery as a tool of the oppressor is considerable more subtle. The message is conveyed through the framing of the factory in the piece. The factory is visually separating the workers from capitalist class. The piece implies the function of the factory, within the power structure, as a symbol of control. Those who control the factory can control the workers. The cartoon, calls on this imagery to make a direct link between the power dynamic of feudal society and the power structure of the late 19th century. The factory and machinery working as a separating force used to keep the power structure in place. The violence in the cartoon is the threat of retaliation if one does not submit to the factory owners.


(Ehardt, 1889)

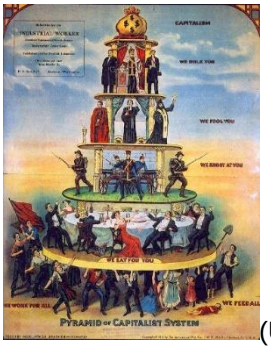
(Unknown, 1894)

The depiction of violence during this time period does not end with the violent oppression of the masses, but it also shown as a primary tool of the working class to break free of the worker-capitalist power dynamic. In “Leader of the Luddites” (Unknown, 1870), Nathaniel Ludd is depicted leading the Luddites to freedom, while a factory burns in the background. The cartoon once again displays the importance machinery plays in the power dynamic. Through the destruction of the factory that houses the machinery, the workers are able to obtain new freedom. The imagery perpetuates the Marxist idea of a violent struggle between the classes. For workers to break free of their violent oppression, the cartoon and Marx dictate that must overthrow the power destruction through the destruction of what perpetuates it.

(Unknown, 1870)

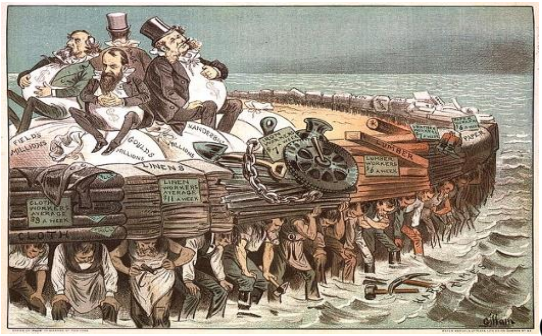
The second theme discovered in the analysis of political cartoons is directly tied with Marx’s alienation of labor. The theme portrays humanity separated from each other with the introduction of machinery as a

catalyst for that separation. “Pyramid of Capitalist System” (Unknown, 1911) displays the separation of man from each other in a hierarchical depiction of capitalist society. The structure is held up by working class people but those who form the upper ranks of the structure are few in number and hold the power. The cartoon also works to expound upon the idea of the power dynamic within capitalism by placing capitalism itself at the peak of the pyramid. The visual implication is that no group, despite their position, is above the capitalism itself. Under capitalism, all are subservient to the profit motive. The piece explains that the structural aspect of the oppression. Even if the structure in question contained a single level of people, those people would still exist under the hierarchical structure of capitalism where profit maximization holds control over all. As a result, the structure works to separate man from fellow man in order to retain the structure itself. The different levels of the pyramid representing the different roles capitalist society creates in order to retain its power structure.



(Unknown, 1911)

“Protectors of our Industry” (Gilliam, 1883) uses a similar visual styling through the representation of a physical separation between classes. The significant difference is the cartoons representation of machinery in the piece. The physical barrier separating the working and capitalist class is made of goods and machinery. The barrier is also what is physically holding the workers down. The piece makes a clear distinction concerning the importance of production as a separating force. Produced goods and the machines used to produce them are not presented as the positive outcome of one’s labor. The machines and goods are positioned as a harmful and dangerous base for the capitalist class’s money and power. The piece somewhat comments of the production cycle and the place workers hold in society as a result of that production cycle. Workers are held under the final product in the larger societal structure. Not only are the capitalists protected against the oncoming water but also the goods and machines. Man is separated and forced into a situation where inanimate objects are placed higher than them in the societal hierarchy.


(Gilliam, 1883)

The final cartoon that displays the concerns society has about the separation of man is the 2009 cartoon, “Social Networking” (Keefe, 2008). The focus of the cartoon is placed more on the introduction of machinery rather than the place machinery holds in an already existing hierarchical structure. With the introduction of machinery, people in society become isolated from each other. The visual representation being the then and now comparison the cartoon provides. Once technology is introduced, the individuals in the piece turn their back to each other and isolate themselves. The piece displays the idea that technology as a tool works to isolate humanity and creates the separation of connections by dividing our attention.

(Keefe, 2008)

The commodification of man is represented in both Progressive and modern era American society. The art (McCay ,1913; Marjulies, 2012) depicts the grim reality that the final product is often held above the human lives it cost in order to produce. Human life under the capitalist structure devalues life to the extent of humanity becoming an input good. Human life is equated to just another cost. The two cartoons also offer a juxtaposition in the depiction of violence. While the cartoon about the mill girls portrays the violence against workers as an active process, the modern era depiction of the violence is passive. In the mill girls cartoon, the girls act as an input good into the machine being used, the water wheel. In the modern cartoon, the commodification comes in the form of the lives of Chinese workers being an input good into manufacturing technology for the creation of consumer technology.

(McCay, 1913)

(Marjulies, 2012)

The final theme presents the argument that the introduction of technology removes humanity from their natural state. In the analysis of this theme, “Leader of the Luddites” (Unknown, 1870) is once again analyzed. Ludd is guiding workers to a more natural world, with the visual representation of him leading them towards greener pastures. The cartoon also invokes biblical imagery. Ludd, in the cartoon, is the symbolic representation of Moses leading the Israelites out of Egypt. The implication through the use of symbolism is that Ludd is leading workers out of a proverbial slavery and back to their natural state of freedom.

The theme of separation from nature continues into the modern era of political cartoons. “Farm to Market” (Duffy, 2012), depicts technology as a pollutant into a natural cycle. The pollutants on display is not only the smog created by the machinery but also the pollution of the soul. The farm to market stand is presented as warm and welcoming. The farmers appear happy and every fruit is handled with acre. The factory farm in comparison is cold, with the machine merely harvesting and dumping the produce as part of a simple and uncaring process. The introduction of machinery into the agricultural landscape robs not only the land, but also humanity from a natural and happier state of being.

(Duffy, 2012)

"Social Networking" (Keefe, 2008) similarly depicts the theme of separation from nature due to the introduction of technology. An understanding of the piece in this context can be found by focusing on the framing of the fire. Not only does the fire work as the center point of the cartoon, artistically it represents the center point for humanity. Around the fire is where humanity gather and engages in socializing together as a cohesive unit. The introduction of technology leaves the fire, the center of human interaction, neglected and fizzled out. Humans are social animals. When socializing is neglected, humanity is neglecting its own humanity.

CONCLUSION

The evidence provided by cartoons is an affirmation of historical materialism. The existence of these cartoons reinforces historical materialism. The creation of cartoons about the plight of working people was not a development purely from the ether. Instead, the cartoons were an artistic outcome reflecting the history and influences that had an effect on the artist. The creation of the cartoons are an artist's reaction to society. Therefore, the art is influenced by the society in which it is produced. The existence of the relationship between art and society provides proof to the historical materialism theory.

The cartoons prove that the current concept of machine displacement as a relatively new phenomena is a fallacy. The idea that the displacement of workers occurs when a new invention is brought into the marketplace is relatively new in human history is false. The cartoons provide evidence that this phenomena has occurred throughout human history. One can assume that the current issue of worker displacement will not be the last instance. However, pontificating that the experience of such displacement has never been overcome before is incorrect. The belief that technology will lead to a cataclysmic labor crisis is hyperbole. Beyond the failure to frame the issue of worker displacement appropriately, there exists a localization aspect to that failed framing. Technological friction is the result of the system of capitalism, rather than an isolated instance affecting only a select few of the world's population.

The conflict between man and machine is not the central cause of worker anxiety, but is a singular factor in a larger hierarchical system that leaves workers powerless. Eras of technological shift function as

the catalyst for revealing the lack of power workers have and force workers to acknowledge the separation caused by the structure of capitalist society. Societal conflict forms as workers attempt to cope with their learned reality. In an attempt to comprehend the reality of the situation, many turn to blame the machines themselves. The fear however is a simplification and only blames one part of a larger whole. In the cartoons, the themes are evidence proving the existence of the capitalist-worker power dynamic. While each of these cartoons features machinery, the central core of their message comments on a larger system. The origin of oppression is the hierarchical system of the profit motive, where capitalists hold the power, control, and freedom in society. The reason a worker is laid off in favor of a machine is not because of the machines existence. The reason is profit maximization. Workers are laid off because those with power in the company made the decision to lay them off. The fault is not on inanimate objects or those who invented them. Those at fault are capitalists who hold the power to decide. Workers are left powerless, without control over their own lives. This is the power dynamic that Marx talked about. It is the power dynamic reflected in the work of cartoonists. The conclusion that the blame lies with capitalists is not a condemnation of profit maximizing firms, but is instead an acknowledgment of the power structure that exists within capitalist society.

Future work into the cross-section between economic theory and art, specifically cartoons, is required to better materialize the relationship. Additional analysis would investigate additional forms of art for similar thematic consistencies found in political cartoons. Future research should explore tangible political changes that result during times of intense technological change, specifically technological change that directly impacts the labor force. An analysis of the history of technological policy change would provide evidence of governmental reaction to societies concerns about technology. Finally, empirical work can be done to give numerical investigation into the shifts in the production of political cartoons, and provide additional backing to the theories stated. Empirical research could include analyzing the quantity output of cartoons about machinery in relation to unemployment numbers, among other topics. With additional empirical information, one could possible extract statistically significant influences on political cartoons and people's feelings about machinery.

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Environmental Security and Economic Challenges in Agriculture for Viable Food Security in India

Babita Srivastava, Ph.D.*

ABSTRACT

India is one of the fastest growing countries with high demands in all areas of infrastructure growth, from increase in population, and with this, an increasing need for food sources. The economic impact plays a very important role in this area, especially in a developing country like India. The gap between progress in this area and upkeep of food manufacture and farming has grown to a point of pervasive hunger and malnutrition among much of India. Among these affected are the majority of children who are underfed and undernourished. This food insecurity stems from an unavailability of food, insufficient purchasing power, and unsatisfactory application from the household level.

INTRODUCTION

What is food security? As defined by the Food and Agriculture Organization (FAO) of the United Nations (2013): Food security "exists when all people at all times have both physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs for an active and healthy life." There are several issues that contribute to food security. Those challenges include: increasing global population, climate change, portable water shortage, loss of arable land, urbanization, increasing food wastage, food related issues, malnutrition and obesity.

Food security, in general, is increasingly affected by global economic and environmental phenomena. Under this, the food prices are affected due to food scarcity which causes social and political instability, a nd can escalate humanitarian crisis.

In India, many people do not have enough money to feed themselves twice a day. About 20% people live below poverty level (less than $1.9 per day). To be considered above the threshold of malnourishment, modern technologies today have allowed us to figure out what is needed for the average female, male and child to sustain their energy intake. As stated by Prema Ramachandran (2013), "Recommended dietary allowances form the basis of several important interventions to improve the nutrition security, including efforts to maintain national self-sufficiency in food production, poverty line computations, interventions for improving the food and nutrition security of people living below the poverty line and food supplementation programs aimed at bridging the gaps between dietary intake and requirements of the vulnerable segments of the population." One can see Table 1 for the recommended Dietary allowances that have been calculated for the average Indian.

Table 1: Recommended Dietary Allowance (RDA) for Indians

Group	Reference weight (kg)	RDA for ref wt person (Kcal/day)	Actual intake (Kcal/day)	Gap
Adult man	60	2730	2000	730
Adult woman	55	2230	1738	492
Pregnant		350 more	1726	854
lactating		500 more	1878	852
1 - 3 yr	12.9	1060	714	346
4 - 6 yr	18	1330	978	352
7 - 9 yr	25.1	1690	1230	460
Boys				
10 - 12 yr	34.3	2190	1473	717
13 - 15 yr	47.6	2750	1645	1105
16 - 17 yr	55.4	3020	1913	1107
Girls				
10 - 12 yr	35	2010	1384	626
13 - 15 yr	46.6	2330	1566	764
16 - 17 yr	52.1	2440	1630	810
Infants				
0-6 m	5.4	497		
6 - 12 m	8.4	672		

Source: The Indian Journal of Medical Research

There's also significant issues with nutrition as a result of not being able to eat as well as living under the poverty level. In 2016, 38.7% of children under five were considered stunted, which means they were below average height. This is a strong indicator of "chronic malnourishment in children and pregnant women, and a largely irreversible condition leading to reduced physical and mental development" (Ritchie et al, 2018). The issue is not only in the children but for many adults as well. Malnourishment within the adult population can be considered as severe, with 15% of the total population defined as malnourished (Ritchie et al, 2018).

TECHNICAL INTERVENTION AND CONSIDERATIONS TO IMPROVE FOOD SECURITY

In order to improve food security, India should exploit the biotechnology revolution, which, as stated earlier, involves the use of transgenic crops. Genetically modified crops require less water compared to other crops and increase the yield per hectare. They could also benefit from the information and communication technology revolution and promote knowledge-based development across the nation. Other actions that must be taken include, managing natural resources, such as land, water, and biodiversity, addressing environmental concerns, managing climate change, minimizing adverse impacts of natural disasters and implementing technological inputs such as using quality seeds, fertilizers, irrigation as well as adequate and timely availability at affordable costs.

A gradual shift from the cultivation of food crops to the cultivation of fruits, vegetables, oil seeds, and crops which act also as industrial raw materials is another consideration. The use of more and more land for construction of factories, warehouses and shelters has reduced the land under cultivation. There has been a decline in productivity of land. Fertilizers, pesticides and insecticides, which once showed dramatic results, are now being held responsible for reducing fertility of the soil (Daga).

India needs to utilize direct application of digital and other technologies to increase farm productivity and address the increasingly visible climate change impacts. Remote sensing (via satellites), GIS, crop and soil health monitoring, and technologies for livestock and farm management are commonplace.

Digital technology can guide crop and input selection, facilitate credit and insurance, and provide weather advisories and disease- and pest-related assistance, and real-time data on domestic and export markets. Competitive markets and demand for consistent food quality make adoption of tech-based solutions necessary for the Indian farmer. Yet, much of the scope for application and innovation remains unexploited.

Information and communication technologies (ICTs) and apps aimed at empowerment, enablement, and market expansion, are becoming ubiquitous. E-choupal exemplifies an efficient supply chain system, empowering farmers with timely and relevant information to enable better returns for their produce. With a community-centric approach, it also provides farm insurance and farm management practice. The Prime Minister emphasized that e-governance can create transparency and improve governance, by IT-enabling citizens and arming them with information.

CLIMATE CHANGE IN INDIA

Extreme weather such as droughts, short-term floods, heat events, multiple weather-related risks in the same season, and declining and more variable rainfalls is not uncommon in India. As according to Ritchie, Reay and Higgins (2018), Climate change “impacts on crop yields remain highly uncertain; the importance of temperature thresholds in overall crop tolerance makes yield impacts highly dependent on GHG emission scenarios.” Though it is uncertain it most certainly can affect food security. India is facing a high degree of climate variability. GDP growth is attributable to yearly variations in rainfall. The Himalayan eco-system is now highly vulnerable. The increase in mean sea levels will affect large populations in peninsular and coastal India. Gangotri Glacier, located in Uttarkashi District, Uttarakhand, India, in a region bordering Tibet, is one of the largest glaciers and is retreating. Rainfall in India may increase by 15 to 40% and annual mean temperature by 3 to 6 degrees. As indicated by Brahmanand et al (2013), “the temporal and spatial variations in precipitation including rainfall may result in deficit moisture stress, i.e. drought or excess moisture stress condition, i.e. flooding” (p. 842). India may suffer huge losses to livelihoods as a result. The agricultural sector would be most affected. Table 2 showcases data retrieved from the India Meteorological Department in regards to the prevailing crops grown in India and the decline of each as a result of the temperature increase and rainfall decrease.

Table 2: Impact of Weather Shocks on Farm Revenue

	Extreme Temperature Shocks	Extreme Rainfall Shocks
Average Kharif	4.3%	13.7%
Kharif, , Irrigated	7.0%	7.0%
Kharif, Unirrigated	5.1%	14.3%
Average Rabi	4.1%	5.5%
Rabi, Irrigated	3.2%	4.0%
Rabi, Unirrigated	5.9%	6.6%

Source: Survey calculations from India Meteorological Department

Forming is still a backbone of the Indian economy and huge proportion of the population still depends on agriculture for its livelihood. Agriculture contributes around 14 percent of the total Indian Economy The annual economic survey, published by India's finance ministry on Monday, said changes in climate could shrink agricultural income by as much as 25 per cent in unirrigated farmland and 18 per cent in irrigated areas within the next 82 years (Annual Economic Survey 2018, India Finance ministry).

PROSPECTIVE OF FOOD SECURITY

As described by Chetan Choithani (2017), "the failure of economic growth to make a significant dent on food insecurity is also because the benefits of faster economic growth have largely bypassed a large proportion of India's poor, particularly those residing in the rural areas of the country." Even with relatively small income increases, demand increases for basic food staples will exceed supply, mostly due to the underlying metrics (population, land area). Imports might not forestall major food price increases due to logistical constraints (volumes) and farm income realities in high income countries. Emerging technologies including biotechnology can support productivity increases which can help in addressing problems of hunger and poverty, provided risk assessment has been done and public confidence won. With appropriate policy support and judicial blending of traditional technologies with biotechnological tools, smallholder women farmers and rural youth can become the engines for agricultural productivity growth and contribute to avoid food crisis in the near future.

INCREASE PRODUCTION

There are several means of increasing production. India needs to develop varieties, hybrids, transgenics that help increase production by 25% from current levels. As according to Malay Mundle (2018), "it is claimed that there are several benefits gotten out of GM crops, like it has reduced chemical pesticide use by 37%, increased crop yield by 22%, and raised farmers' profits by 66%" (55). Increasing the use of land for GM crops would be beneficial. They should also develop and refine technologies that increase production by at least 25% from the current level. It would also make sense to develop varieties

and technologies that use fewer resources (25%) but permit acceptable or relatively better output. They should also improve profitability of farming and living conditions of farmers as well as involve women and rural youth in agriculture.

SUSTAINABLE PRODUCTION

Food security is achievable but business-as-usual policies, practices and technologies will not work. To produce a diversified array of crops, livestock, fish, forests, and biomass (for energy) in an environmentally and socially sustainable manner we need to imbed economic, environmental and social sustainability into agricultural policies, practices and technologies. We also need to address today's hunger problems with appropriate use of current technologies, emphasizing agro-ecological practices (e.g., no/low till, IPM and INRM), coupled with decreased post-harvest losses. To address future demands, supplementing or complementing emerging technologies for increased productivity and crop protection in the era of climate change will help in that regard. It may also diminish natural resources, but the risks and benefits must be fully understood.

CONCLUSION

Despite having the fastest growing economy in the world, India is struggling to feed their growing population. Given the magnitude of the challenges, coherent, climate-smart, integrated, national- and state-level agricultural policy and strategy frameworks are needed. Half of the forming in India depends on seasonal rain to water its crops and this is a major concern. In times of heavy rain, crops are inundated or washed away; when rain is scarce, farmers resort to pumping more water out of the earth to water their crops, depleting groundwater resources as a result. India must minimize their dependency of seasonal rain. India should also work toward making agriculture more drought resistant and increasing agricultural water use efficiency to produce "more crop per drop." The Indian government should take an initiative to develop low cost technological innovations to reduce the amount of water used for the production of rice and wheat, which are the main food sources in India. Low cost innovations not only reduce water usage in agriculture but also make farmers less vulnerable to climate variability, especially as it relates to the monsoon season.

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Unequal Inequalities and Global Convergence

Joshua Greenstein*

ABSTRACT

Any discussion of inequality includes an implicit normative or ethical comparison of distributions. The manner in which inequality is defined and measured will affect these comparisons. Methodological choices therefore may have effects on public perceptions and ultimately even policy outcomes. I've applied 'absolute' and 'centrist' measures to some well-known research results related to global inequality and convergence obtained using relative measures, and illustrated how these different measures put these familiar findings in a new light. I argue for the utility of using a broader array of inequality measurements, specifically in terms of those that take into account absolute differences.
JEL CODES: D30 D31 D63 O15

INTRODUCTION

Robert L. Heilbroner once wrote that "every social scientist approaches his task with a wish, conscious or unconscious, to demonstrate the workability or unworkability of the social order he is investigating" (Heilbroner 1973). This observation is surely even truer in the case of studies of inequality and distribution. Whether inequality is bad, or necessary, or even worthy of discussion, is an inherently political question (Wade 2012). Atkinson (1970) asserts that any discussion of inequality includes an implicit normative or ethical comparison of distributions; a certain distribution of some good, or of gains in that good, is acceptable or not acceptable, is better or worse, is improving or stagnating. If discussions of inequality inevitably involve rankings and comparisons of different distributions, then how inequality is defined and measured will affect these rankings and comparisons, as has repeatedly been demonstrated (Ravallion 2003, Atkinson and Brandolini 2004, Atkinson and Brandolini 2010, Bosmans, Decancq, Decoster 2014, Niño-Zarazúa, Roope, Tarp 2016, Galasso and Hoy 2016, Hickel 2017, Ravallion 2018). The choice of measurement of inequality is therefore not value neutral.

MEASUREMENT CHOICES MATTER

A large body of social science research and theory emphasizes the importance of which types of quantitative measurements of social phenomena are chosen, how they are chosen, and by whom. Choosing specific indicators to measure abstract or complex phenomena can impact policy priorities, have normative effects on discourse, and affect popular understanding of said phenomena (Merry 2011, Fukuda-Parr, Yamin, and Greenstein 2014). If numerical indicators are poorly chosen, they can have distorting effects on all of the above (Fukuda-Parr, Yamin, and Greenstein 2014). Choosing a measurement also chooses the meaning of a concept, and in turn may affect our perceptions of that concept and the potential solutions (McGranahan 1972, Porter 1994, Merry 2011, Davis, Fisher, Kingsbury, and Merry 2012, Fukuda-Parr, Yamin, and Greenstein 2014). In addition, choice of

measurement sets standards by which progress, or lack thereof, is then measured (Davis, Fisher, Kingsbury, and Merry 2012, Fukuda-Parr, Yamin, and Greenstein 2014). The choices of the economics profession concerning which traits are necessary to measure inequality properly, which measures are most widely used, have the potential to impact public perceptions and ultimately policy. Davis, Kingsbury, and Merry (2012) write that if indicators are tools of governance, then actors who promote specific indicators, along with those who influence the form of said indicators, should be "counted among the governors."

Recent survey-based research indicates that received information about inequality might impact individuals' beliefs and policy preferences. In one study, individuals' beliefs about inequality of opportunity, and about redistributive policies aimed at reducing the income gap, were affected when they were shown statistics depicting increasing income inequality (McCall et al 2017). The researchers claim that their findings show that increasing awareness around inequality can increase support for policies aimed at reducing it (McCall and Richeson 2017). Other recent research contends that it is not high inequality itself, but perceived high inequality, which correlates with demands for redistributive policy (Gimpleson and Triesman 2017). Cross-country studies have also found a correlation between perceptions of large pay gaps and the strongly held belief that inequality was too high (Kiatpongsan and Norton 2014). This research suggests that people's perception of inequality has an effect, independent of actual levels of inequality, on factors such as their policy preferences and their beliefs about the relative fairness of economic systems.

The impact of economic studies of inequality on public perception is readily visible in the popular media. As an example, Milanovic's "elephant chart" (2012, 2016), discussed shortly, has been widely discussed in the media, where it has been described as "the most important chart for understanding politics today" (O'Brien 2016), the "most powerful chart of the last decade" Kawa 2016), "the story of globalization in 1 graph" (Thompson 2014), and the subject of prescient warnings that readers should "get ready" to see it "over and over again" (Kawa 2016). Hickel (2017) documents how conservative and libertarian commentators promoted Milanovic's research as evidence for their own preferred political positions. More generally, a common narrative, both in the media and in academic work, has been global convergence; a narrative that all poorer countries and people, or of groups of poorer countries such as China and India, or the "BRICS," or the "global south," have been catching up to or overtaking the currently wealthy world (See, for examples in popular media, Schwartz and Saltmarsh 2009, Voight and Censky 2010, O'Sullivan 2011, BBC 2013, Cowen 2014, Bui 2014, Weller 2015, Swanson 2016). The story of convergence, argues Hickel (2017), is inherently a political defense of current policy regimes. A potentially relevant question is whether this politically appealing message is a cause of, or effect of, the methodological choices used in assessing global trends.

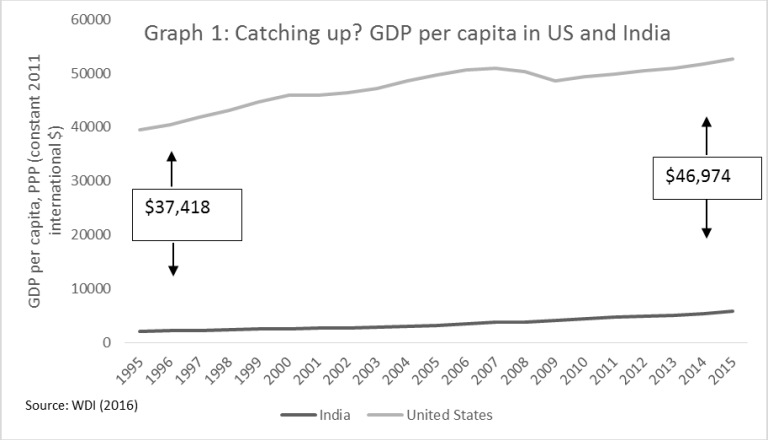
RELATIVE VS. ABSOLUTE MEASURES OF INEQUALITY

Relative measures of income inequality are based on proportions of a total amount, or on the ratio of one group or individual's income to another. An absolute measure depends on the actual numeric distance between groups or individuals of the unit in question. The different measures can often result in very different interpretations of whether inequality has increased or not. As an example, if one individual had $10, and another $100, and then both experienced an increase of 20%, relative measures of inequality would register this movement as no change in distribution, despite the fact that the difference in income would have changed from $90 to $118. It would be at least equally reasonable to consider this change an expansion of inequality, or, at least, non-inclusive growth (Wade 2013).

The most commonly used measures of income inequality in academic literature tend to be relative, rather than absolute measures of inequality. The most commonly used measure of income inequality in the field of economics research for many years has been the gini coefficient. The standard gini as typically used is a purely relative measurement. Other popular measures of inequality are often based on comparisons of proportions of total income along the income distribution, such as a comparison between the top 10% and bottom 40% of income earners sometimes referred to as the 'Palma ratio' (Palma 2011, Cobhan et al. 2013) or the proportion of income of the top 1% of earners that is the focus of the research of Piketty, Saez, and Zucman (Piketty, Saez, and Zucman 2016), as well as of popular protest movements. These are all relative measures. (The slightly more exotic 'generalized entropy' class of measures often found in the literature, such as the Thiel Index, are also relative measures).

For a simple example of how the use of only relative measures can change perceptions, consider the story of developing countries, such as India, "catching up" to the US. It is quite common to hear the idea that India and China are gaining on the US economically, and from a particular perspective that is clearly what is happening; India has consistently been growing at a higher growth rate than US, and until recently, was considered the fastest growing country globally. Undoubtedly, this fast growth is an important phenomenon and there is a great deal of change happening within India. However, it might be surprising to many to learn, that after two decades of faster growth, the gap between India and the US's gdp per capita has actually grown, in absolute terms. See figure 1, below.

Figure 1



A quick back of the envelope calculation suggests that if India's gdp per capita were to continue to grow at 5% annually, and the US's were to grow at 1.5.% (the approximate average from last 20 years for both), the absolute gap would not even begin to shrink for more than three decades! These average growth rates would need to continue for almost 70 more years before the two countries had an equal gdp per capita. Besides the unlikelihood of these rates continuing for that period of time, it is not even clear that it is possible for all of the people in currently less wealthy countries to equal current levels of production in wealthy countries, due to resource and other environmental limitations (Daly 2007, Foley 2012, Woodward 2015). It seems fair, then, to ask in what sense Indian output per person is or is not "catching up."

Only relative measures satisfy one of the commonly used "axioms" of inequality measurement "scale invariance," which states that a new distribution created by equal proportional changes to all incomes should have the same level of inequality as the original distribution. Studies based on questionnaires and surveys have found that individuals did not tend to prefer distributions in accordance with the commonly used axioms (Harrison and Siedl 1994, Amiel and Cowell 1999), and that that scale invariance only received about fifty percent support in questionnaires. Ravallion (2014) also suggests that many people tend to think of inequality in absolute terms. Zheng (2007) asserts that the "only justification that has ever been advanced" for scale invariance is the requirement that an inequality measurement does not show a different level of inequality if measured in a different currency. Others have argued that the axioms are not connected to any "real world experience" or "external value system" (Amiel and Cowell 1999). However, adherence to this axiom imposes a particular normative perspective. One of the other axioms, anonymity, is regularly ignored, in order to study horizontal inequality, such as that between racial groups. This axiom is ignored because horizontal inequality is an important phenomenon that cannot be studied while sticking to the axioms.

At this point, it may be relevant to ask why we care about inequality in the first place. There are a wide variety of "instrumental" reasons that inequality might matter, such as low growth (Alesina and

Rodrik 1994), an inefficient allocation of investment (Birdsall 2001, Stiglitz 2013), insufficient aggregate demand (Stiglitz 2013), or negative or corrupting effects on governance (Birdsall 2001, Stiglitz 2011, Stiglitz 2013, Deaton 2017).Individual happiness and satisfaction may also be influenced by one's position relative to others (Easterlin 1973, 1995, Clark and Oswald 1996, Solnicka and Hemenway 1998, Boyce, Brown, and Moore 2010, Agarwal, Mikhed, and Scholnick 2018). Most of these negative repercussions are unlikely to be related to relative inequality only. Intrinsically, we may care about inequality due to a desire for a fair and just world. Atkinson (1970) convincingly asserted that there was no reason to believe that social values would accord with mean invariant (relative) measures. Indeed, it is reasonable to think that as incomes increase, we care about inequality more (Atkinson 1970).

RIGHT, LEFT, AND CENTER

Purely absolute measurements, however, may also be misleading. As noted by Subramanian (2014), most would not consider a situation in which one person had $0 and another had $1 million to be equal to one in which the first person had $1 million and the second has $2 million, despite the absolute inequality being the same in both cases. A third, intermediate type of measure, explained shortly, is also a possibility. The French economist Serge-Christophe Kolm provided definitions of these three types of measures, and also equated them to different political or normative perspectives (Kolm 1976, 1976). Kolm categorized measurements of inequality as "rightist," "centrist," and "leftist," depending on their treatment of inequality as an absolute or relative concept. Leftist measures are sensitive to absolute changes; they do not change when all incomes go up by the same absolute amount. An example of this type of measure would be the absolute gini, which is a standard gini coefficient multiplied by the mean of the distribution. Kolm defines centrist measures as measures which show increased inequality when average incomes rise and the relative distribution stays the same, and decreased inequality when all incomes rise by the same absolute amount. Rightist measures are purely relative; when all incomes go up in the same proportion, they are unchanged. The use, typically, of only one of these three equally legitimate types of inequality measures disguises an implicit judgment on how gains of growth should be distributed (Subramanian 2014).

Wade (2013) has argued that absolute measures are the most relevant in comparing income and wealth inequality over time in situations of growth, and would be a both a better indicator of true inequality and serve to increase the political salience of issues of distribution. Subramanian (2014), on the other hand, advocates for centrist measures on the grounds that they hold a number of desirable properties that neither of the "more extreme" rightist or leftist can satisfy. These include an intermediate gini, which is the product of the absolute and relative gini, as well as the measurement proposed by the mathematician Manfred Krtscha and subsequently endorsed by Subramanian, which is the coefficient of variation (a relative measure of distribution) multiplied by the standard deviation (an absolute measure) (Krtscha 1994, Subramanian 2014, Subramanian 2015).

$$KRTSCHA=(1\mu\sqrt{\sigma}2)*\sqrt{\sigma}2$$

Subramanian (2014, 2015) explains that any product of an absolute and relative measure of poverty will have the characteristics of a centrist measure. Subramanian also argues that the Krtscha index is ideal for measuring changes in distribution in a situation of growth.

APPLIED EXAMPLE: MEASURING TRENDS IN GLOBAL INEQUALITY

As an illustration, I've applied some of these absolute and centrist measures to some very influential research results obtained using relative measures. I revisited the well-known work of Milanovic (2012, 2016) who tracked income inequality globally over the last three decades. One portion of Milanovic's work used gini coefficients to track both inequality between countries' gdps per capita, weighted by population, and the global population as a whole. I've (roughly) recreated his results below, using data from Maddison (2013) and Lakner-Milanovic (2013), as in the original. The important point to note for the purposes of this essay is the trend of clear declining inequality in the population weighted inequality by country, particularly in the most recent years, and the flat/slight decline shape of the interpersonal inequality trend.

Figure 2

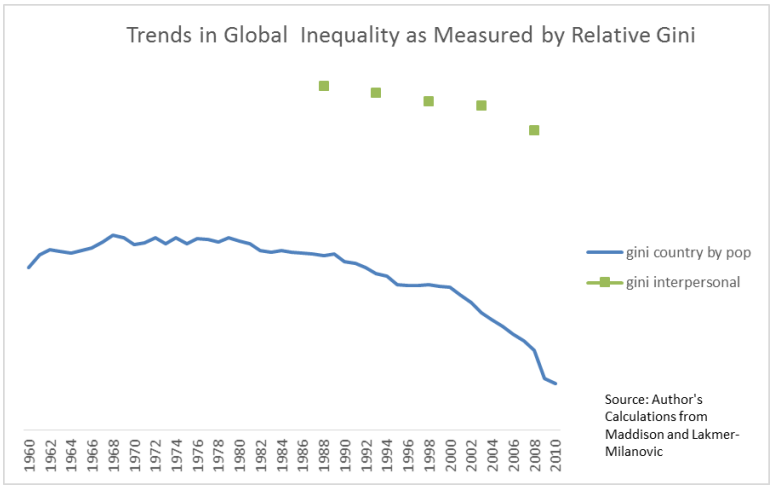
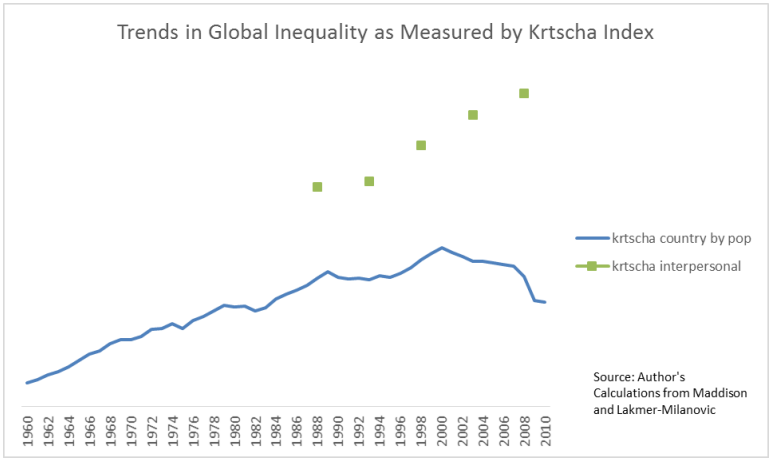


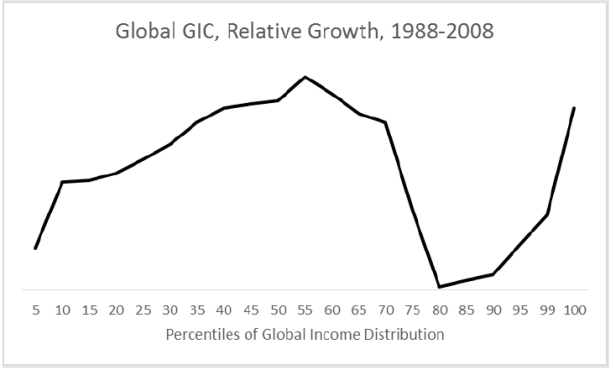
Figure 4



Using a centrist measure, the Krtscha Index, instead, we find global inequality between countries rising, rather than falling, throughout the 1960s, 70s, 80s, and 90s. There is a slight drop in the last decades, but inequality remains at a higher level in 2010 than it was in 1960, a very different result than that found using the relative gini. The interpersonal global inequality, calculated for 1988, 1993, 1998, 2003, and 2008, found a slightly downward trend using the gini, but a rising trend using the Krtscha index. The centrist measure shows a very different story of what has happened to global income inequality over the last half-century.

Perhaps the most famous result, however, from Milanovic's work is the so-called "Elephant graph," discussed earlier. This graph, reproduced below, shows relative growth in per capita income for each ventile of the global population. The result emphasizes the relative "winners" and "losers" of globalization, as high income earners and the middle class in India and China saw large relative gains, while the lower classes in the wealthy world did not.

Figure 5



Panel 1 : Author's Calculations, using Lakner-Milanovic World Panel Income Distribution. (2013)

Panel 2 : Author's Calculations, using Lakner-Milanovic World Panel Income Distribution. (2013)

Using the same data to show absolute gains in GDP per capita for each ventile (Figure 7) provides a very different perspective. The absolute growth curve, as would be expected, shows gains in the top percentiles in amounts many times greater than any of the lower ventiles. The resulting image depicts gains accrued in massive amounts to the upper percentiles, while only in significantly smaller amounts to the entire 90% of the global population. While an unsurprising result, the image created tells a very different story than one that shows the global middle class to be among the "winners" of the last two decades.

CONCLUSION

This paper argued that methodological choices in assessing inequality are inherently a value-laden exercise that may have effects on public perceptions, norms, and ultimately even policy outcomes. I argued for the utility of using a broader array of inequality measurements, specifically in terms of those

that take into account absolute differences, and then illustrated how the use of different, equally valid measures, shed new light on some familiar stories. A reader might object, “You have chosen a different measure, of course you have found different results!” However, that is precisely the point. The choice of measurement is determinate of a researcher’s conclusion, and the choice of measurement is not value-neutral, but indicative of an implicit judgement about what type of inequality we should care about and on how the gains of growth should ideally be distributed. If relative measures are to be used virtually exclusively, then that choice should be explained and defended, from a normative, value-based, not only technical, perspective, rather than, as per Subramanian (2014), used mainly as the result of network effects and inertia.

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ENDNOTES

1. “Developed” countries include the U.S., Canada, Western Europe, New Zealand, Australia, and Japan. All other countries were put in “developing.”

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An International Review of Gender Gap on Executive Compensation

Xu Zhang[2]

ABSTRACT

While many studies have confirmed gender pay gap in the labor market with human capital explanations and the theory of discrimination, the study on gender pay gap at executive level is still limited. It has been well identified that about 4.6% of female hold top executive positions in corporate world (2016 Catalyst Report on Fortune 500 companies) and there was about 12%-15% gender pay gap in large publicly traded firms (Mohan, 2014). Researchers focused on gender gap on executive compensation across industries and countries by using various sources of data (for instance, S&P 1500 Executive Compensation database). The results are mixed and some are even contradictory due to characteristics of the labor markets. This study finds existing studies on gender gap on executive compensation are overrepresented by U.S. large publicly listed firms and only about 1/3 of studies report female executives are comparably compensated as male counter parts. In addition, all the studies collected in this research go beyond the scope of human capital explanation, and include at least either firm's characteristics from management perspective or corporate governance attributes in the empirical analysis.

1. INTRODUCTION

Gender wage gap has been widely documented in many professions including the executive positions. Despite the fact that more highly educated and career dedicated women entering the field, more and more attention has been given to underrepresented female leadership in the work place. Although women have become better represented in top executive jobs in recent decades, women only hold about 4.4% of all CEO positions in the top 500 listed companies in the United States (Catalyst, 2017 Report). In term of senior management role, less than a quarter (24%) of senior roles are held by women worldwide in 2016, while about one third (33%) of businesses have no women in senior management roles. In addition, women's representation at executive level varies across regions and countries. Among the largest publicly listed companies in the European Union (EU-28) in 2016**,** only 15% of executives and 5% of CEOs are women. While Italy had more than a quarter (29%) of women in senior roles, Ireland (19%), the Netherlands (18%), and Germany (15%) performed lower than the global average (24%) in 2016. Leading the roll, women filled almost half (45%) of senior roles in Russia in 2016. As for Asian countries, women held about16% of all senior roles in India, 30% in China and only 7% in Japan (Grant Thornton, 2016 Report). Despite stagnant wages and high unemployment, high executive compensation especially CEOs' remuneration has received much attention from the public concerning about fairness and equity (Kaplan 2008). While the public debate has focused on whether CEOs are rewarded excessively, little attention has been paid to the question if female executives are underpaid compared to

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their male counterparts. Studying gender inequality in the context of executive compensation complements the existing study about income inequality and help shed some light on the explanations of gender wage gap.

Prior empirical work has examined women being historically under-represented in corporate management may be due, in part, to asymmetric information about productivity-related characteristics such as labor-force attachment (Oakley, 2000), professional and academic qualifications (Adams et al., 2007) as well as business networks (Bartlett and Miller, 1985). Furthermore, the surrounding institutional environment and general market opportunities also play an important role in the promotion prospects of women. Additionally, evidences on gender difference on executive compensation mainly are based on microdata of a single country. The literature also extends Becker's seminal study in 1957 on economics of discrimination and often adopts human capital investment theory with decomposition techniques (pioneered by Blinder (1973) and Oaxaca (1973)) to capture the gender differences on executive compensation in labor market endowment.

However, none of these studies provide a systematic evaluation on the data and research methods of each research on executive compensation. Therefore, I would like to conduct a meta-analysis on gender gap on executive compensation across countries. Meta-analysis is a helpful approach to cumulate, review, and assess prior empirical studies. Papers investigating one particular topic are collected and analyzed on their data and research method. Meta-analysis then allows evaluating the effect of different data characteristics and methodologies on the result reported, e.g. a regression parameter (Stanley, 2001). Instead of the usual practice of analyzing observations of individual holding executive positions, each previously conducted study represents one data point in meta-analysis research. Since not every study on executive compensation reports the estimated gender difference in pay, this paper starting with a system review which hopefully will lead to meta-analysis on gender gap on executive compensation.

The rest of paper organizes as follows. Section 2 surveys the determinants of executive compensation in the literature. Section 3 reviews interdisciplinary studies on the explanations of gender executive pay gap. Section 4 describes the sample data. Section 5 presents the preliminary conclusions and discusses future extensions.

2. THE DETERMINATNTS OF EXECUTIVE COMPENSATION

Researchers have shown that the level of total executive compensation mainly depends on firm's characteristics and executive attributes. Firm size (Renner et al 2003, 2005, Cordeiro et al. 2003, Gu and Choi 2004, Chalmers et al. 2006, Gu and Kim 2009, Lee and Chen 2011), firm performance (Cordeiro et al. 2003, Gu and Choi 2004, Chalmers et al. 2006), a firm's leverage (Chourou et al. 2007, Gu and Choi 2004, Kim and Gu 2005), a firm's ownership structure(Lee and Chen 2011, Ramaswamy et al 2000) are popular firm's characteristics being studied in the existing literature. Executive's age or experience

(Madura et al. 1996, Chourou et al. 2007, Lee and Chen 2011), tenure (Santerre and Thomas 1993, Sander et al. 1995, Madura et al. 1996, Yu and Lin 1997), educational background (Santerre and Thomas 1993, Madura et al. 1996) are executives' characteristics which affect the level of compensation. In addition, studies on ratios of different components of compensation or pay-to-performance sensitivity provide additional dynamics on understanding executive compensations.

Labor Market Attributes

Following the work done by Mincer (1974), Gius (2007) adopts an economic approach to examine the impact of experience, industry classification dummy variables, and firm performance on the compensation of 975 CEOs who were included in Standard & Poor's ExecuComp database in 2002. While little effect from firm performance (measured by net income per sale or return on equity) and specific industry is found to explain the CEO compensation, experience turns out to have a positive effect on CEO pay. However, it is worth to mention that educational background is not included in the analysis. Similarly, Chalmers, Koh and Stapleton (2006) examines top 200 stock exchange listed firms in Australia and suggests economic attributes along with governance and ownership attributes are significant determinants of various components of CEO compensation. Using a 4-year span, Chalmers et. al (2006) find a positive pay-for-performance link in fixed salary, bonus and option compensation components (an evidence of rent extraction or labor demand theory). In contrast to the US evidence where CEO rent extraction is more pervasive, economically significant and last longer (at least 5 years into the future), CEOs in Australia are able to extract rent in bonus and option compensation component over a 1-year period but not beyond. Instead of studying the level of CEO compensation, Chourou et. al (2008) look at the economic determinants of stock option mix (measured as the ratio of annual CEO stock option awards value to cash compensation) and the pay-performance sensitivity of stock option awards to CEOS in large publicly traded firms in Canada. They document a negative relationship between stock option mix and CEO age, i.e., older CEO tends to receive less stock option awards compared to cash compensation.

Agency Theory

Although labor market attributes capture a significant portion of the variations of individual worker's wage, the study on CEO compensation should go beyond the human capital theory. In fact, most executives tend to be more experienced and holding advanced degrees. As a result, many researchers address CEO compensation through agency theory, in which a principle (owner) employs an agent (executive) to take actions to achieve maximum pay-offs for the principal. The principle may not be able to know the agent's actions, therefore, the principle will design a contract to link the agent's compensation with the company's performance and motivate the agent to optimize the principle's interest.

Agency model of compensation has been subjected to intensive empirical testing, but result is still mixed. Jesen and Murphy (1990) and Madura, Martin, Jessell (1996) document that the link between pay and performance in US firms is very weak; Gu and Choi (2004) report no significant effect of stock

performance on cash compensation of CEO in US Casino industry. Hussain, Obaid and Khan (2014) also indicates no significant effect of firm performance measured by rate of equity (ROE) on CEO total compensation in Pakistan firms. By contrast, Ceccucci and Gius (2007) demonstrates firm performance measures have a positive effect on compensation in US IT industry. Other studies that support the linkage between firm performance and CEO compensation include, but not limited to, Daily, Johnson, Ellstrand and Dalton (1998), Cordeiro and Veliyath (2003).

Management Power Theory

The fix component of CEO compensation is related to the magnitude of the job responsibilities, complexity and the firm's operation risk. Therefore, some researchers in the field of Management propose to examine corporate governance and incentive schemes to explain CEO compensation. For instance, managerial power theory suggest top executive can influence over the corporate board members which determine the executive's compensation package. In the similar context, Daily, Johnson, Ellstrand, Dalton (1998) investigates the relationship between compensation committee composition (proportion of affiliated director, proportion of interdependent director, proportion of CEOs on committee) and the structure of CEO compensation. Directors are labelled as "affiliated" if they are managers of the firm or have other personal or professional relationship with the CEO. Directors appointed during the tenure of incumbent CEO are termed "interdependent" directors. Daily et. al (1998) finds no support for a relationship between the structure of CEO compensation and the presence of an affiliated or interdependent directors in the board. Cordeiro and Veliyath (2003) verifies that no significant effect of CEO duality (the jobs of CEO and Chairman split between two individuals) and the compensation. In addition, they also find after controlling for firm size and performance, diversification of the businesses and outside director's ratio tend to positively relate to CEO compensation while inside ownership (internal managers and CEOs holding the firm's stocks) tends to negatively correlate with CEO compensation.

Tournament Theory

Pioneered by Rosen (1986), tournament theory considers the working of organizational hierarchies as a sequential elimination tournament during which employees compete with each other to move to the next level along the hierarchies. Due to the small chances to be promoted, employees in each level expect to receive rewards to put on their effort climbing on the ladder. Before reaching the position of CEO, employees expect the highest level of rewards as there would be no higher positions after becoming CEO. Therefore, CEOs are compensated well to reach the highest level of company job hierarchies. Chen, Ezzamel and Cai (2011) indicates executive pay considered as tournament prize is not related with number of contestants in the tournament, but is negatively related with the interaction term of number of contestants and the government ownership.

Others

Besides above factors affecting the executive's compensation, political power also plays a role in the determination of executives' remuneration. For instance, Chen, Ezzamel and Cai (2011) studies Chinese listed companies and finds positive but weakly relationship between executives' connection to the government/ Party and their compensation. Although since the 1980s the Chinese Communist Party (CCP) and government have decrease their shares to reduce the voting control over operational issues in listed companies, the government still gasps ultimate control over mergers and acquisitions, the disposal of shares and assets, the appointment, removal, performance evaluation, and remuneration of CEOs/Chairmen (Fan et al., 2007). In companies with large government ownership, control and decision rights are shared between the Secretary of the CCP's committee at the company, the Chairman and the CEO. Therefore, when an executive also serves as a Party Secretary, his/her power becomes stronger, creating room to pursue self-interest including large compensation. Similarly, Cao, Ban, Tian (2011) finds CEO pay is inefficient in firms controlled by State Assets Management Bureaus (SAMB) as it is insensitive to market-based economic performance.

3. LITERATURE REVIEW ON GENDER EXECUTIVE PAY GAP

Despite decades of anti-discriminatory legislation, the gender wage gap still persist (Mincer and Polachek 1974, O'Neil and Polacheck 1993, Becker 1957) and has been widely documented in the economic literature. On average, women are paid 88 percent of the earnings of male counterparts in the United States. Although human capital theory provides several reasons why women might receive lower wages than comparably qualified men, which consists of interrupted labor-force participation, selection into lower-paying industries or occupations, lower promotion rates and job mobility, the mysteries of gender differences on executive compensation remain uncovered as females who work all the way up to the top management positions tend to be more educated, experienced and engaged in the labor market. The "taste for discrimination' model developed by Becker (1971) indicates that if the owners of corporations (i.e. shareholders) have a taste for discrimination against female executives or managers, women will be paid less than men with similar labor market attributes.

The literature on gender-based discrimination among top management positions consists several explanations: sticky floors and glass ceilings, occupational and industrial segregation, tournament theory, the glass cliff, and the network embeddedness effects. Booth et al. (2003) suggest that male managers' salaries are more frequently raised, therefore, the "return-to promotion" is higher for male as they more frequently seek and receive external offers, and more likely to change companies; while female managers are less frequently promoted and receive lower pay even if they receive the promotion opportunities. In addition, researches also argue the pay differences can stem from the allocation of men and women across corporate ranks (Jones and Makepeace 1996) or industry effect and occupational segregation (Kidd and Goninon 2000, Bertrand and Hallock 2001, Allen and Sanders 2002) as suggested by Alkadry and Tower (2007) that "gender typing and socialization tend to result in the segregation of women in

certain agencies, occupations and positions". Others relate gender executive pay gap to corporate performance and gender differences in the attitudes towards intra-firm competition: men are twice as much to engage in corporate tournaments than women and therefore, male mangers' compensation packages are more performance-sensitive (Niederle and Vesterlund 2007, Kulich et al. 2011). Some researchers assess network embeddedness effect on discrimination which impacts the gender executive pay gap. Network embeddedness, referring to the extent to which board members are connected to their peers via multiple directorships, thereby connecting the focal company to others (Geletkanycz and Boyd 2011), may increase or decrease the gender executive pay gap with two opposing arguments: homophily among members of the economic elite versus resource provision and learning function of embedded boards (Oehmichen et. al 2014).

Prior empirical work also evolves in methodologies and focuses on various components of executive compensation, which is often defined as a package comprising salary, bonuses, stock options, restricted stock options and long term value of granted stocks. In the earlier stage, due to the fact that female executives are highly underrepresented in top management positions, some analysis often compare the average or median size of the gender executive pay gap and draw conclusions on the possible causes of the pay difference at top executive level without controlling for individual labor market attributes (position, work experience or tenure, age) or firm characteristics (such as firm size, firm leverage, firm performance, internal governance structure and board structure, etc). In term of data sources, some analysis are based on household survey data which are lack of employers' information, while other research employ worker-employer match datasets through large publicly listed firms which are required to disclose information on top executives including their compensations and work history. In addition, researchers not only study different component of the executive compensation package (Lam et al. 2013, Munoz 2010, Li and Wearing 2004), but also examine factors which influence the relative weight of compensation package (Kulich 2010, Renner et al. 2002), which makes it an interdisciplinary study across economics, finance, management and social science.

Yet the finding of whether there is a gender executive pay gap is still mixed. Some studies find female executives are compensated less than male counterparts, while others do not find a significant gender difference in executive compensation. Burress and Zucca (2004) use U.S data and claim gender pay gap of top executives are more due to human capital differences. Carter, Franco and Gine (2017) examine S&P1500 firms and find female executives earn less than male counterparts (7% in salary and 15% in total compensation) due to female risk aversion and lack of female representation on the board. Duong and Evans (2016) study CFOs from Top 500 firms in Australia and find a significant gender pay gap of CFO, but the gap dissipates when female CFO is matched by propensity score method, that is, the gap decreases as female and male CFOs become more comparable. They also suggests selected gender differences in CFO compensation can be explained by gender-based differences on personal risk preference. Additionally, Gray and Benson (2003) survey Directors of Small Business Development

Center and find when tenure, education, age, size, performance, affiliation are held constant, female executives are compensated significantly less than male counterparts. Plus, Kulich, Trojanowski, Ryanand Haslam (2010) study matched sample of executive directors in the board room and find there is a significant gender pay gap in executive positions throughout UK after controlling for industry, company size and director position.

In other contexts, the gender gap in executive compensation has been found to be small or even not existent. Adams, Gupta, Haughton, Leeth (2007) find that women are not as highly compensated as men before becoming CEOs but the few who reach the CEO position receive similar compensation as men. They claim no evidence on CEO gender pay gap. But female top executives excluding CEOs earn 16 -17% less than male counter parts after controlling for experience, firm size and profitability. Bertrand and Hallock (2001) use EXECUCOMP data from 1992 to 1997 and find that among top 5 executives, women representing 2.5% of the executives, earn 45% less than male counter parts. Among the gap, 70% was explained by the fact that women managed smaller companies and were less likely to be CEO, Chair or company President after controlling for rank. Bowlin, Renner and Rives (2003) suggest after controlling for company size, company performance, company pay philosophy (CEO pay), female executives are equitably compensated as male counterparts. Additionally, Gayle, Golan, Miller (2012) find female executives earn less than male counter parts, even though they are paid significantly more at most ranks for the same experience and their overall promotion rate is higher than male. After controlling for rank, there is no gender pay gap on executives; contradict Albanesi and Olivetti (2008), this paper also check gender gap on pay-for-performance sensitivity and finds female executives are rewarded more for positive abnormal returns and punished less for negative returns than male counter parts.

4. DATA ANALYSIS

In this section, I first describe how I construct the sample data. Then I discuss the sample statistics. Next I will report a survey on the gender executive pay gap based on the sample data.

Sample Data

First I collected all relevant articles from the *Economic Literature Index*, Jstor and Inter-science and Science Direct to survey the determinants of executive compensation. The keywords used during the initial search are the following: wage, executive compensation, CEO pay. Then for the second round of search, key words such as gender wage gap, gender executive pay gap, executive compensation, CEO pay are used. To select studies, the following criteria were applied:

1. The study includes an empirical analysis of executive compensation;
2. The study reports at least one estimate of gender gap at executive compensation
3. The study uses gender as a dummy variable.
4. The study was published since 1990s.

5. The study reports number of observations.
6. The study is written in English.

At the first round of survey on the determinants of executive compensation, 37 papers were collected and carefully reviewed. Each paper is coded and sorted by the author in term of publication record (publication or not, publication year, type of publication and field of study), data characteristics (dataset, sample size, empirical study method, country, industry, data type and data coverage year) as well as main conclusions. Moreover, each study is noted with positive or negative drivers on executive compensation (the detail spreadsheet for this survey and the list of studies are available upon request).

The second round of survey examines the gender gap on executive compensation. As a result, 76 studies were collected and carefully reviewed. After applying the selection criteria, the number of target papers drops down to 35 due to the following reasons: 1) Not relevant to gender gap on executive compensation (can be gender wage gap on non-executive compensation); 2) Not reporting estimates of gender gap due to lack of empirical analysis; 3) The "gender" variable shows up on the related topics such as compositions on the boardroom, or compositions on the remuneration committee, but not on the executive compensation. Similarly, each paper is coded and sorted by the author in term of publication record (publication or not, publication year, type of publication and field of study), data characteristics (dataset, sample size, estimated effect size, percentage of female executives, empirical study method, country, industry, data type and data coverage year) as well as main conclusions. In order to identify all the relevant studies on gender gap on executive compensation, a search on key terms through google scholar will be done as an extension to current study. But the following statistical analysis is based on the current 35 studies. Table 1 demonstrates the studies are over represented by the U.S. data, mainly because of data availability as large publicly traded firms are required to disclose the information about the top executives including their compensations. As a result, 71.43% of the studies focus on the U.S. data while UK is the next biggest group in term of data availability. By industry classification, mixed industries (more than 4) dominate as this group mainly refers to large publicly traded firms in the US, UK or Germany. In the US, industries include Food/Agriculture, Entertainment/Leisure, Consumer/Retail, Health Care, Textile/Construction/Manufacture, Drug/Chemical, Mining, Utilities, Electronics and Finance. In addition, public service, tourism and manufacturing sector, high tech manufacturing sector and non-profit sector are also included in the analysis. In term of publication avenues, the fields of publication are equally split across Economics/Finance and Accounting/Management.

Table 1. Data Sources, Industries, and Sample Periods of Primary Studies on Gender Gap on Executive Compensation.

Country	Frequency	Total Number of Studies (%)
US	25	71.43
Australia	1	2.86

China	3	8.57
Denmark	1	2.86
Germany	1	2.86
Norway	1	2.86
UK	2	5.71
US, UK, France, Germany	1	2.86
Industry		
Public Service	1	4.17
Tourism and Manufacturing Sector	1	4.17
High Tech Manufacturing Sector	1	4.17
Mixed (more than 4)	19	81.5
Non-profit Sector	1	4.17
Multiple (10 industries)	1	4.17
Field of Publication		
Economics or Finance		50
Accounting, Management		50

In addition, most studies in the sample covers at least three years while 7 analysis are based on one-year sample (data available on request). To answer the question "Is there a gender gap on executive compensation", 24 out of 35 studies report the gap at least once, while 11 studies confirm no evidence of gender gap on executive compensation, among which 9 from US, 1 from UK and 1 from China.

Table 2. Conclusions on "Is There a Gender Gap on Executive Compensation?"

	Frequency	Percentage
Yes	24	68.57
No	11	31.43

Additionally, all of the studies in the sample data control for at least one category of variables on 1) Human Capital Attributes such as age, tenure, educational level; 2) Firm Characteristics such as firm size, firm performance, risk and leverage; 3) Governance characteristics such as CEO duality, board size, board independence, ownership concentration, and the percentage for the three categories is 75%, 85% and 40%, respectively. Only 33% of the studies controlled all the three categories of variables in their empirical analysis.

Table 3. Studies on Gender Gap on Executive Compensation Controlling for Three Different Categories of Variables

	Control for Human Capital Attributes (age, tenure, educational level)	Control for Firm Characteristics (size, performance, risk, leverage)	Control for Governance (CEO duality, Board size, Board Independence, Ownership Concentration)
Control	Yes	Yes	Yes
Frequency	75%	85%	40%

5. CONCLUSION AND FUTURE EXTENSIONS

While women have made considerable advances in workplace, women still remain underrepresented in top management positions. Moreover, women may be underpaid even they make it all the way up to the top of the corporate world. Despite the fact that gender wage gap has been extensively studies with human capital theory and Becker's theory of discrimination, little has been done to investigate the gender gap on executive compensation. Plus, the answer to whether female managers are paid less than their male counter parts remains mixed. According to the author's survey on 76 studies on gender gap on executive compensation, around 1/3 of the studies claim female mangers are paid comparably with their male counterparts after controlling for firm and individual characteristics. In order to estimate the gender differences on executive compensation, the estimate of the gender gap from each study needs to be calculated or obtained from the authors of those studies who didn't report the estimate in the paper. Therefore, after search for the relevant studies on gender gap on executive compensation through google scholar, each collected study will be coded based on the estimated gender gap on executive compensation as well as sample size and percentage of female executives in the sample. Thus, a regression-analysis based on all the empirical studies on gender gap on executive compensation can be obtained.

In addition, the review also helps to uncover that fact that studies on gender gap on executive compensation tend to cluster for the U.S. and U.K cases. Future researchers should seek for additional datasets especially for developing countries to complement current study on gender inequality. Researchers can also extend the analysis to various different industries for broader empirical evidence.

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Clarifying The Migration Decision: How Much More (Or Less) Do People Earn After Leaving Buffalo?

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ABSTRACT

This paper adds to the literature explaining migration decisions of individuals, with focus on individuals in the Buffalo, NY area. With 11 years of American Community Survey data, we estimate the impact of moving out of Buffalo on individuals' income, while controlling for demographic characteristics that might affect income. We find perhaps surprising results that individuals who move out of Buffalo tend to have lower incomes than those who stay. Though, results also indicate that females who move from Buffalo have higher incomes, on average, than those who remain in the Buffalo area.

INTRODUCTION

Substantial research has examined individuals' motives for moving from one geography to another. This paper follows in that vein but seeks to examine how different outcomes might be after having moved from one geography, in particular – Erie County, NY, which includes Buffalo. To test whether or not people who move do better economically than those who stay, this paper uses eleven years of American Community Survey (ACS) data to identify those who have moved from the Buffalo area and examines how well those who move do relative to those who stay. To proxy for economic outcomes generally, we use an individual's income, and seek to explain variation in income with migration status, while also controlling for other demographic characteristics shown in the literature to be correlated with income.

After controlling for other characteristics, which include age, educational attainment, sex, citizenship status, employment status, and marital status, this paper finds that individuals who move make less, on average, than those who stay in the Buffalo area. Including interacted variables, further regression analysis is used to determine whether the tendency to have lower incomes after moving is uniform across genders, educational attainment levels, and ages. Findings suggest that the effect differs by each of these characteristics, and women tend to benefit from moving from Buffalo in terms of their income.

LITERATURE REVIEW

There are many examples of research in the economic literature on the causes and effects of migration. Bartel (1979) uses data from the National Longitudinal Survey of Young and Mature Men and the Coleman Rossi Retrospective Life History Study to determine the relationship between job mobility

and migration. Using this data, Bartel runs logistic regressions and finds that wage has a negative effect on migration. A decision to move is also influenced by job market characteristics, family status, length of residence in the original location and wage changes as a result of the new position.

Nelson (2008) used Public Use Microsample Data from the 2000 Census to create both ordinary least squares and geographically weighted regressions. Nelson found that migration of individuals with nonearnings income (both social security and investment income) is impacted by demographic factors, quality of life, economic variables and other variables such as housing market costs and immigration rates. Nelson also discovered that individuals who migrate with nonearning income are older in age and tend to be in the late stages of their career. These individuals tend to migrate to nonmetropolitan areas.

Kennan and Walker (2011) created an economic model using data from the National Longitudinal Survey 1979 Cohort and data from the 1990 Census. They found that an individuals decision to take part in interstate migration is effected by income prospects, location specific payoff shocks, and if the area is a solid geographic match for the migrant. Kennan and Walker also found that many migrants tend to take part in return migration; where the individual moves back to the area they originally migrated away from.

Geist and McManus (2012) used data from the 1995 March Basic Files and the Annual Social and Economic Supplement of the Current Population Survey. They completed cross sectional and longitudinal panel analysis with this data finding that individuals are more likely to move for reasons other than for a job opportunity. These reasons include quality of life and family reasons. They also found that ones sex and family status (single, married, with/out children) will affect ones income after migration. If a woman is a secondary earner the researchers found that if they move for family or quality of life reasons decreases their likelihood to add to the labor supply after migrations.

Shumway and Davis (2016) used panel data from the Economic Freedom Index for North America produced by the Fraser Institute and income migration data from the Internal Revenue Service/Census Bureau for each state from 1995-2010. Shumway and Davis found that a higher level of economic freedom is positively correlated with income gains and vice versa for states with low economic freedom. They also found that Florida gained the most income from migration whereas New York lost the most. Lastly, they found that income losses as a result of migration is highly centralized where as the income gained from migration is more spread out between a higher number states.

Ruyssen and Salomone (2018) compiled data from the Gallup World Polls with a sample from 2009-2013 creating probit estimates containing interactions. In this study it was found that females are motivated to move if they feel discriminated against. However, if the female actually can make the move is determined by household income, network effect, and family obligation. Single women are more inclined to migrate. Lastly, when males are more dominant both politically and economically females are less likely to move out of their home country.

Chen and Rosenthal (2008) found that three main factors affect an individual's decision of where to move. These three factors were climate, consumer amenities and high quality business environments. It was found that older individuals move for climate, whereas younger individuals move for consumer

amenities that make an area more desirable in terms of entertainment and for high quality business environments where jobs are available. For example, the high quality business environment of New York City is a major reason it attracts so many young people from elsewhere in the United States and abroad. Ganong and Shoag (2017) stated that in-migration increases available labor supply of highly skilled individuals, which causes supply to shift to the right. Areas that attract migrants then have lower wages as the supply of skilled labor is higher than it would be in the absence of migration.

DESCRIPTION OF DATA

To estimate the effects of migration, this paper uses a repeated cross-section of 2006-2016 1-year American Community Survey (ACS) data. The ACS is an annual survey of approximately 3 million individuals performed by the United States Census Bureau. It includes a large amount of person-specific data that allows for the identification of a number of demographic variables, whether or not a person moved, from where they moved and individual income data. Because of our narrow scope in looking at data for Erie County, NY, the annual data was combined to increase the sample size to estimate the magnitude of the income differential with some reliability and significance.

We used a number of variables to control for other characteristics that would likely have an impact on income. For example, individuals in dual income families may choose to work less and have lower individual incomes, or they may be able to work more as their spouse can provide household services and would therefore have higher incomes. Females may choose occupations that have lower wages and have slower career advancement, or they may be more likely to have multiple jobs and therefore earn more. Lastly, individuals who fall in the age range of 21-30 may make less than older individuals because they have less work experience.

Table 1a. Variable Descriptions and Means

Variable	Description	Mean
Pincp	Total person's income	33,734.49
Fferp	Gave birth to child within the past 12 months, Yes=1, No=0	0.0082
Married	Married, Yes=1, No=0	0.4075
Divorced	Divorced, Yes=1, No=0	0.0867
Employed	Employment status Employed=1, Not Employed=0	0.4845
Laborforce	Employment status In the labor force=1, Not in the labor force=0	0.5176
Moved	Moved from Erie County elsewhere in the US =1, Stayed in Erie County=0	0.0491
Bachelors	Bachelor's degree = 1, Educational attainment less than bachelor's degree = 0	0.1110
Graduate	Graduate degree = 1, Educational attainment less than graduate degree = 0	0.0598
Citnew	US Citizen = 1, Not a US Citizen=0	0.9599
Female	Female =1, Male =0	0.5094
A21through30	Between Ages of 21-30 =1, all else = 0	0.1368

A31plus	Above age of 30 =1, all else =0	0.5825

Table 1a shows the variables that were included in the initial regression. Dummy variables were created to estimate the income differential between the different groups. The American Community Survey (ACS) contains variables on many demographic factors that could be correlated with one's propensity to move. The authors seek to explain variation in individual income with these demographic factors and migration status. Many of the variables were created using specific values of each variable taken from the ACS[i]. For example, for any individual who lived somewhere outside of Buffalo, but indicated that they moved from Buffalo within the last year, the "Moved" variable would be equal to one. Otherwise, it would be equal to zero.

To investigate what percentage of individuals fell into a specific category, means for each variable were calculated. It was found that the average total person's income of our sample was $33,734.49. Looking at table 1a one can see all of the means for each variable. For example, 40% of our sample was married, 48% were considered employed, 51% of the same was female, and 11% held bachelor's degrees. Individuals who moved made up 4.9% of our sample. Using 11 years of data 4.9% of our sample is approximately 412,000 individuals that have moved out of Buffalo.

Table 1b. Variable Interactions and Means

Variable	Description	Mean
Movedxbachelors	Bachelor's degree holder who moved = 1, all else =0	0.0055
Movedxgraduate	Graduate degree holder who moved =1, all else =0	0.0028
movedxA21through30	People between the ages of 21 and 30 who moved =1, all else =0	0.0141
movedxA31plus	People above the age of 30 who moved=1, all else =0	0.0200
Movedxfemale	Females who moved=1, all else =0	0.0235
FemalexA21through30	Females between the ages of 21 and 30=1, all else =0	0.067
FemalexA31plus	Females above the age of 30=1, all else =0	0.306
movedxA21through30 xfemale	Females between the ages of 21 and 30 who moved=1, all else=0	0.0067
movedxA31plus xfemale	Females above the age of 30 who moved=1, all else=0	0.0097

Interacting our moved variable with educational attainment, age, and sex, the correlation between income and migration was made more obvious. These interactions were then placed into our regression. Table 1b shows the means for each of the interactions. One can see from table 1b that 0.55% of our data moved out of Buffalo and had a bachelor's degree. Using 11 years of data, 0.55% represents

approximately 46,000 individuals. Table 1b also shows that 2.4% of our sample moved out of Buffalo and were female. Those who moved out of Buffalo and had a graduate degree represented 0.28% of the data. Those individuals who moved out of Buffalo and were between the ages of 21 through 30 represented 1.4% of our sample.

To further investigate the income profiles of individuals who move, triple interactions were created. Triple interactions allow one to further investigate the correlation between income and migration. For instance, those individuals who moved out of Buffalo, were female, and were between the ages of 21 and 30, a subset of particular interest to the authors, made up 0.67% of the data. Individuals who moved, were female, and held a bachelor's degree was 0.29% of the sample. Individuals who moved, were female, and held a graduate degree 0.16% of the sample. Lastly, individuals who moved, were above the age of 31, and held a bachelor's degree was 0.26% of the data.

Table 2. Conditional Means of Income

Variable	Average Income	Standard Deviation
Females	$25,245	34,009
Males	$42,740	57,676
Bachelor's Degree	$54,420	61,478
Graduate Degree	$80,948	87,699
Age 21-30	$22,899	23,954
Age 31 and Older	$40,699	53,012
Moved	$25,946	41,246
Didn't Move	$34,153	48,104
Female, Bachelor's Degree	$40,419	45,882
Female, Graduate Degree	$56,901	53,793
Male, Bachelor's Degree	$69,230	71,584
Male, Graduate Degree	$106,067	107,086
Female, Age 21-30	$19,551	21,271
Female, Age 31 and Older	$29,493	37,068
Male, Age 21-30	$26,100	25,862
Male, Age 31 and Older	$53,068	64,063
Bachelor's Degree, Age 21-30	$31,575	26,610
Bachelor's Degree, Age 31 and older	$60,554	66,402
Graduate Degree, Age 21-30	$43,410	31,944
Graduate Degree, Age 31 and older	$84,872	90,694

As a first estimate of the difference in income between those who move and those who stay, we present conditional means. As can be seen in table 2, variables believed to be significant are stated alongside their average incomes. Females make on average $25,245 compared while males have an average income of $42,740. Bachelor's degree holders on average make $54,420, while graduate degree holders make $80,948. Individuals who fall between the ages of 21 through 30 have an average income of $22,899, while older individuals showed an average of $40,699. Individuals who moved out of the Buffalo area made on average $25,946, compared to those who stayed making on average $34,153. Females who held a bachelor's degree made approximately $40,400 compared to males who also held a bachelor's degree made $69,230. Females in the age range of 21-30 made on average $19,550 and males in this age group made approximately $26,100. Graduate degree holders who fell in the age range of 21 and 30 made approximately $43,410 and graduate degree holders above the age of 31 made approximately $84,800.

To estimate how different incomes are for individuals who move out of Buffalo, we run an ordinary least squares (OLS) regression, controlling for multiple demographic characteristics. The results of which can be found in the first column of table 3.

Table 3. Regression Results

Variable	Model 1 No Interactions	Model 2 With Moved Interactions	Model 3 With Triple Interactions
(Constant)	-7954.021***	-7982.352***	-14842.476***
	(91.072)	(92.024)	(102.576)
married	6682.961***	6637.058***	6158.576***
	(39.521)	(39.545)	(39.537)
divorced	1222.956***	1232.911***	1086.652***
	(58.766)	(58.766)	(58.612)
employed	23060.524***	23073.648***	22672.985***
	(81.248)	(81.243)	(81.026)
laborforce	1230.413***	1187.741***	1315.621***
	(82.804)	(82.805)	(82.561)
Moved	-1557.461***	-1816.402***	2982.882***
	(72.423)	(189.841)	(245.352)
bachelors	20728.714***	20983.932***	20906.670***
	(47.016)	(48.176)	(48.043)
graduate	44493.600***	44697.939***	44583.534***
	(61.650)	(63.113)	(62.935)
citnew	11065.042***	11031.132***	10791.493***

	(76.146)	(76.151)	(75.944)
female	-15590.408***	-15922.908***	-1146.110***
	(32.009)	(32.844)	(100.683)
A21through30	2543.864***	2723.401***	6464.190***
	(64.418)	(67.276)	(91.968)
A31plus	19989.458***	20257.251***	29848.608***
	(59.646)	(61.551)	(81.775)
fferp	1413.993***	1251.107***	-699.202***
	(158.550)	(158.542)	(158.388)
movedxbachelors		-5722.495***	-5725.891***
		(216.611)	(216.476)
Movedxgraduate		-4805.545***	-4761.701***
		(288.041)	(287.747)
movedxA21through30		-1103.584***	-3136.925***
		(222.585)	(302.890)
movedxA31plus		-2976.382***	-8400.352***
		(208.401)	(286.424)
movedxfemale		6678.287***	-3011.526***
		(143.861)	(352.241)
femalexA21through30			-7146.968***
			(128.835)
femalexA31plus			-18545.047***
			(107.506)
movedxA21through30xfemale			4077.126***
			(433.682)
movedxA31plusxfemale			10399.793***
			(406.585)

*** significant at the 1% level

The most noteworthy finding of the first model suggests that individuals who moved out of Buffalo make approximately $1500 less than individuals that stayed in the area. One possible explanation of this is that individuals cannot find jobs in Buffalo, and are therefore forced to leave to find employment. Another possible explanation is what was shown in Ganong and Shoag (2017). Individuals who move are most likely targeting areas that have high levels of in migration which increases the labor supply and decreases wages in that area. The remaining estimates are consistent with expectations. Individuals who fall in the age group between 21 through made approximately $2,500 more than those who are less than 21 years of age. Individuals who held bachelor's degree made approximately $21,000 more than

individuals with lower educational attainment, while graduate degree holders made $44,500 more. Individuals who are female make on average $16,000 less than males.

To further investigate how moving impacted one's income profile, interactions with the "moved" variable were included, the results of which can be found in the second column of table 3. Individuals who moved and held a bachelor's degree made approximately $5,700 less than bachelor's degree holders who didn't move. Those who moved and held a graduate degree made $4,800 less than graduate degree holders who didn't move. Individuals who moved and were between the ages of 21 through 30 made less than those individuals who did not move and fell in this age group. Lastly, an interaction was created looking at the impact of migration on income and an individual's sex. Individuals who moved and were females make approximately $7,000 more than females who stay. However, comparing the coefficient on females to the coefficient on movedxfemale, one can see that females still make less than males overall.

The third column of table 3 displays the results of the final regression. This model adds triple interactions to further explain any variation in movers' incomes. The coefficient estimate on the first triple interaction, movedxA21through30xfemale, indicates that females who moved and were between the ages of 21 and 30 made approximately $4,000 more than females who didn't move and were in this age group. The result was even larger for females who moved and were at least 31 years of age. These females made approximately $10,400 more than females who didn't move and were a part of this age group. This result is noteworthy as this group appears to have experienced the largest income gains after having moved, and may indicate a need for further research to determine its cause.

CONCLUSION

Our results indicate that there is a correlation between income profiles and migration from Buffalo, but contrary to what one might expect, those who moved out of Buffalo actually had lower incomes, on average, than those who stayed. When strictly looking at how moving can impact one's income, for an average individual who moved out of Buffalo, income is approximately $1,500 lower after controlling for other demographic characteristics of the individual believed to also impact income profiles. The results of the model that contained interactions showed the effect of moving varied by some of our demographic characteristics. For example, females who moved tended to have a higher income than females who stayed. Individuals with a bachelor's degree were effected more than those with lower levels of educational attainment and more than even graduate degree holders. Individuals who moved and were between the ages of 21 through 30 made less than those individuals in that age group who didn't move. Individuals who moved and fell in the age group of older than 30 years of age had lower incomes than individuals who were members of this age group and didn't move. Finally, females 21 and over had higher incomes after having moved out of Buffalo. For this group, the decision to move may be supported by the findings of this study in terms of the tendency to make more money.

Endnotes

[i] Dummy variables were created for the remaining 11 variables in table 1a. The married dummy variable is 1 for individuals who responded as married and is 0 otherwise. The divorced dummy variable is 1 for individuals who responded as divorced and is 0 otherwise. The employed dummy variable is 1 for individuals who responded as civilian employed, at work, or armed forces, at work and otherwise is 0. The dummy variable for labor force is 1 for individuals who were considered civilian employed at work, civilian employed with a job but not at work, unemployed, armed forces at work, armed forces with a job but not at work, were all included in this variable and is 0 otherwise. The bachelor's degree dummy variable was created from the educational attainment variable and is equal to 1 if individuals held a bachelor's degree and is otherwise 0. Individuals that had a master's degree, professional degree or a doctorate degree were captured by the graduate degree dummy variable. Individuals that had less educational attainment than the three listed above were the excluded group. Using the citizenship status variable, the citnew dummy variable was created. Individuals that were born in the United States, born in Puerto Rico, Guam, The U.S. Virgin Islands, or Northern Marianas, born abroad of American parent(s), or U.S. citizen by naturalization were included in this variable. Individuals who were not a citizen of the U.S. were excluded from this dummy variable. From the sex variable the female dummy variable was created.

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