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Letter from the Editor

The Economics Review at New York University has had an incredible year. Growing and sustaining over sixty staff members, including almost thirty-five contributors writing articles every week has been a challenge that the members have taken into their stride. I could not be prouder of the professionalism, dedication and commitment that I have seen this year, and it our collective honour to present to you, our fifth printed publication.

The Review, over the last year has branched out in partnerships with a number of organizations, on-campus or otherwise, to expand the field of knowledge that we bring in, and to ensure that our members are able to develop the skills that they would like. It has always been a part of the goals of the Economics Review to provide an outlet for our students to express their opinions and views, however this year, we have also seen several students take on new roles within the club. A dedicated marketing and analytics effort aimed at expanding the reach of our online work, combined with an initiative from our very own Printed Publication Managing Editor Jeremy Teboul, to assist our own staff in writing academic research papers has resulted in a broader pool of talent for the future generations of the Review to draw upon.

I am incredibly happy to pass on torch of the Presidency of the Economics Review to our very own Meghna Rangan. Meghna has done an incredible job working with the Online Publication, and I have every faith that she will take the Review further and higher. I am ever-grateful and humbled to have been able to work with such an incredible staff, and do hope that you, the reader, enjoy the fruits of all of the labour that has gone into this publication.

Happy reading!

Sincerely,

Prabhod Mudlapur

Editorial

It is with great joy that I present to you this first Editorial of the Economics Review at New York University. The Economics Review at New York University is an undergraduate organization that publishes student articles, essays, and research papers. Our content focuses on economic theory, policy, and associated fields, such as law, business, politics, and technology.

Our goal is to provide all interested NYU students with the opportunity to conduct research, publish their work, and advance future career prospects. Our student-led editorial staff works with in-house and freelance writers to improve research and writing skills and produce content that will encourage debate and awareness among undergraduates. Every semester, we select academic papers from all undergraduate NYU students to publish in our semi-annual print publication. We encourage not only ambitious economics majors to contribute to the Review but also all other NYU students, regardless of their school, field of study, or degree level.

In our past volumes, the Editor-In-Chief took on the role of reflecting on the works of each author. We introduce the editorial, making this volume a very special one as we share news that have contributed to the growth of our publication. We are proudly announcing that the Economics Review at New York University is now NYU's first publication operating in all three campuses of the Global Network University, with the addition of Sophie Li's research. For the first time, we are publishing the work of a student from New York University Shanghai, NYU's third degree-granting campus in the People's Republic of China. Furthermore, one of our staff editors, David Behrens, has also been contributing to the print publication from NYU's global study-away site in London. Taking the printed publication to a global level has been a very rewarding process and we look forward to giving a voice to many more students around the global network university through our publication.

The printed publication committee has selected five papers for this Spring volume. We have collected a distinguished collection of student research papers which explores dynamic 21st century economies, presents empirical work examining gender norms as well as impact of foreign direct investment, and forecasts the future growth of the American economy. These papers not only offer an examination of the changing world around us but also serve as a reflection of the core values held by NYU's diverse student body.

We would like to thank the authors of these papers for their creative academic endeavors and their special contribution to the Review. This volume was carefully crafted through the collaboration of some of our most active staff editors: We would like to give a special thanks for their contribution to Cameron Taheri, who will undertake the management of the print publication next Fall, and David Behrens.

Finally, we thank our readers for their support and look forward to further expanding the reach of our publication.

Sincerely,
Jeremy Ron Teboul

Monte Carlo Individual Agent Model of Uber Dynamic Pricing System

Liang Shi & An Hoang

This paper studies the Uber platform matching efficiency and how customer behavior affects the overall efficiency based on a Monte Carlo Individual Agent model. Knowing that the central goal of Uber is to calibrate supply and demand in the market, we examined how customers behave in response to the pricing strategies that Uber adopts. The basic and advanced models employed illustrate how the dynamic pricing feature of Uber is stabilizing the market, reducing customer loss, and improving the average salary of drivers.

1. Introduction

The New York Times reported on January 15 2017 that Uber now has outnumbered yellow taxis 4 times in the city of New York. There is no doubt that Uber has attracted a wide range of users. A typical transaction on the Uber platform is as follows: a potential rider opens the application on his phone and requests a ride; the system matches him to a nearby driver if one is available, else it blocks the ride request. Uber does not employ drivers, but delivers a share of the earnings per ride to the driver to incentivize driver participation. The platform is thus a two-sided market: drivers on one side and passengers on the other. Using a complex algorithm, the company aims to calibrate supply and demand relative to each other, while ensuring relatively high satisfaction on both sides. While there are many studies showing that platforms like Uber increase consumer welfare, its effects on the dynamics of the ride-sharing market in terms of earnings, work flexibility, and overall efficiency has been fairly neglected—supposedly due to the difficulty of quantifying and standardizing variables, since there is no consensus on what an "average" Uber driver is.

In this research paper, we will look at how Uber matches drivers and riders as well as how Uber can potentially improve its efficiency based on customer behaviors. To capture the fast time scale dynamics of Uber, we employ a Monte Carlo individual agent approach. Our primary modeling contribution lies in combining the basic individual agent model with the underlying stochastic dynamics to model riders' and drivers' decisions. Our goal is to capture the core principles of this dynamically priced market. For simplicity, we analyze this model first for a single region that is divided into blocks. Each ride involves a driver picking up a rider at one point in the grid, and dropping him/her off in another. We then compare the results from this model with a more complex one that takes into account decisions of both the driver and the rider to accept or refuse the pairing result from Uber's system.

2. Description of the Model

2.1 Basic Monte Carlo Simulation Set-up

All the numerical parameters in this model were taken and modified based on the New York City Uber data in December 2014. Specifically, we scaled our constants (price per mile, wait time, number of ride requests per hour, etc.) to that of the route from Grand Central Terminal to Barclay's Center. This trip takes, on average, 28 minutes to complete and costs $26 for UberX. With a plethora of open-access and trustworthy data on this route, it is the best candidate to help keep our model's results within reasons.

We start by establishing our simulated "world." For the rest of the paper, distances are in miles and times are in minutes. Our first step is to create a 10 by 10 Cartesian grid that simulates a 100 mile2 region in Manhattan, New York City. Before the time counter begins, we randomly generate 33 (hundreds) drivers and place them in this region where each of them will have an (x,y) coordinate that represents their original position.
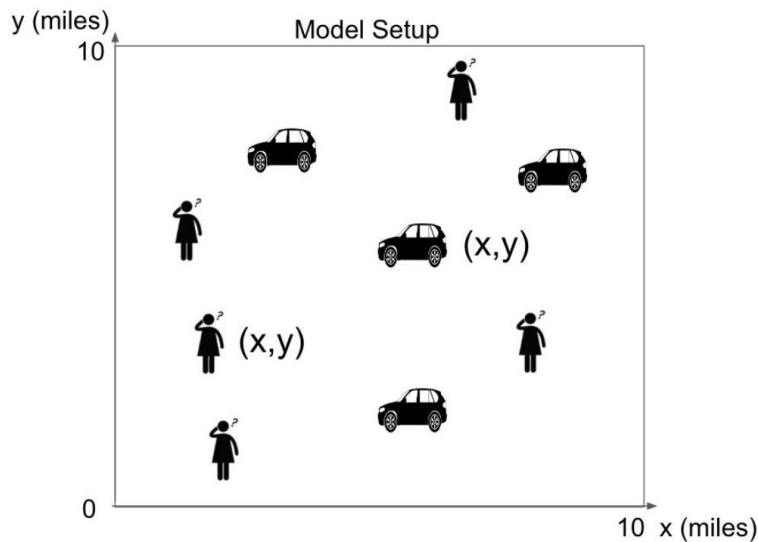
For every minute, a random number of riders is generated based on a Poisson distribution with an average number of 2 (hundreds) riders. Each of the riders will be assigned a destination point that is different from the rider's original position.

2.2 Matching Process

We perform a simple algorithm that matches each rider to a driver. In our simulation, a rider will be paired with the nearest available driver. If two drivers are of the same distance to the rider, the system will randomly pick one driver. An important assumption for the basic model is that drivers and riders are not allowed to choose each other. In other words, they will accept whatever matching results the system gives. The matching process will continue until there is no available driver for the remaining riders who then become lost riders.
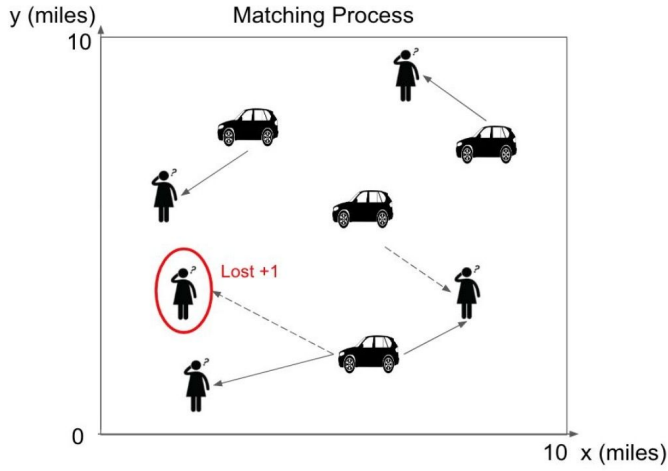
2.3 Advanced Model

In the advanced model, we simulate the dynamic pricing strategy employed by Uber. Over the course of each hour of the day, the number of ride requests appears to have several spikes. As the demand for rides increases, the average price of a ride increases. The price is determined by a coefficient, which is known as the surge multiplier, that is automatically generated by Uber. The surge multiplier we used for each hour in the model was obtained from Uber Analytics.
Furthermore, in the real world, an Uber driver can decide whether to take the next request or not, and a rider can decide whether to confirm his/her request for the Uber service or not. We simulate the mutual selection process by the following equations:

$$P(D) = \beta_0 + \beta_1\ SurgeMultiplier - \beta_2\ CumTrips - \beta_3\ CumFares - \beta_4\ CumHours \quad (1)$$

$$P(R) = \beta_5 - \beta_6\ SurgeMultiplier - \beta_7\ WaitTime \quad (2)$$

where equation (1) simulates a driver's decision to continue driving or be done for the day, and equation (2) simulates a rider's decision to confirm or cancel a ride request. P(D) represents the probability of a driver taking the next ride. P(R) represents the probability of a rider confirming his/her request.

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In equation (1), a driver's decision to take the next request or not is based on the Surge Multiplier for the next ride, which is regarded as the amount of increase in price he/she can expect for the upcoming trip. A driver would be more willing to drive if the Surge Multiplier is high. CumTrips, CumFares and CumHours are the cumulative rides, money, and hours that the driver has taken, earned, and spent before the upcoming trip. The coefficients $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$ can be interpreted as the effects of those factors on the driver's decision. $\beta 0$ is a constant/error term which allows us to take into account the other involving factors such as the impact that weather and traffic conditions have on the driver's decision to accept or deny a ride request.

In equation (2), a rider's decision to confirm a request or not is based on the surge multiplier and estimated waiting time—shown on the Uber application. The coefficients $\beta 6$, $\beta 7$ can be interpreted as the effects that the surge multiplier and estimated waiting time have on the rider's decision. $\beta 5$ is a constant, or error, term.

All coefficients in these equations were generated by logistic regression based on Uber's open data source for New York City in December 2014.

3. Analysis

We run both the basic model and the advanced model over a day to compare the matching efficiency without and with practical considerations, which is measured by the ratio of the number of riders lost to the total number of ride requests (indicated as riders lost to total arrivals ratio below). A smaller ratio indicates better matching efficiency.
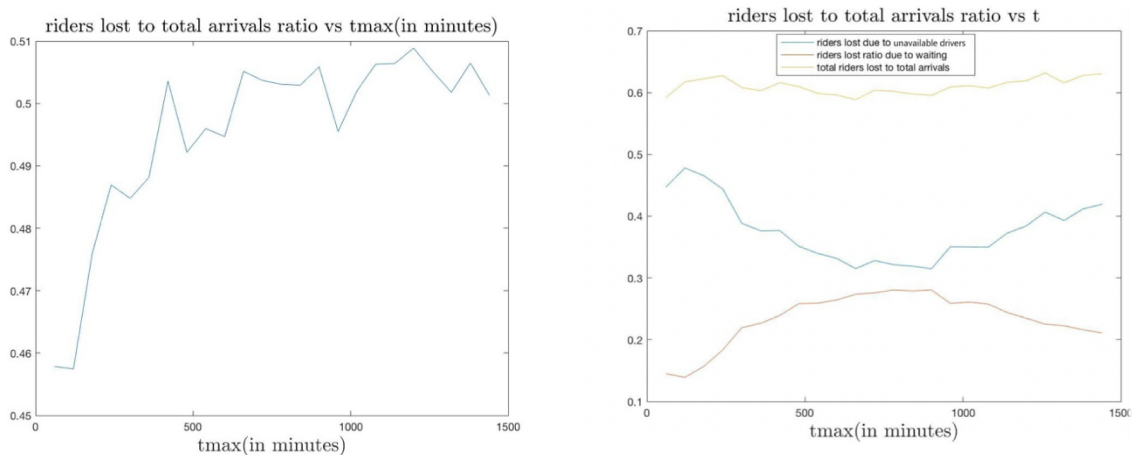

Figure 1: rider lost to total arrivals ratio over time (left: basic model, right: advanced model)

In the basic model (Figure 1, left), the general trend is that the riders lost to total arrivals ratio increases at a decreasing rate as time increases. The only factor that accounts

for the loss of riders is the shortage of drivers for matching. As time increases, more ride requests are generated. Since the total number of drivers is fixed, more ride requests result in more riders lost due to the shortage of drivers. We expect the curve to flatten out when the number of ride requests reaches its limit.

In the advanced model (Figure 1, right), as we assume that riders and drivers can choose each other, there are more factors at play in the loss of riders. We evaluate drivers' decision and riders' decision separately and draw two curves concerning the portion of riders lost due to unavailable drivers and due to waiting. The riders lost to total arrivals ratio stays relatively constant at a high value which exceeds the maximum value in the basic model. We can reasonably deduce that the dynamic pricing strategy employed by Uber together with other practical considerations are conducive to stabilizing the matching efficiency.

In addition, we have found that when surge multiplier is high, the number of riders lost due to unavailable drivers increases, which seems contradictory to our belief that a high surge multiplier will make drivers more willing to take the next ride request. In fact, a high surge multiplier is often also associated with a large number of ride requests. Despite their willingness to take the next ride, drivers are already occupied and thus unable to do it, which results in a rise in the number of riders lost due to unavailable drivers.

The graphs below represent the relationship between the number of riders lost to total arrivals ratio and the number of drivers available on a certain day.
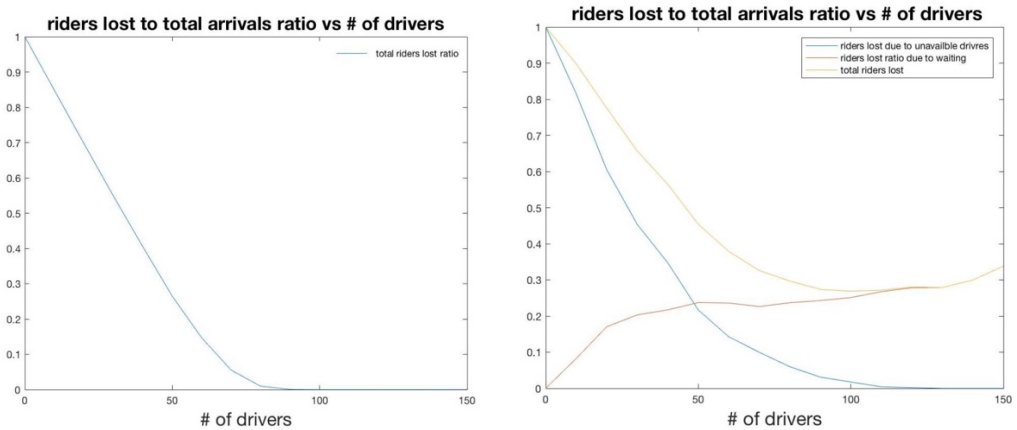
Figure 2: riders lost to total arrivals ratio vs # of drivers

In the basic model (Figure 2, left), we can see that the ratio decreases sharply as the number of drivers increases from 0 to 70, which can be interpreted as more drivers entering the market to meet a huge initial demand. The ratio begins to decrease at a decreasing rate as the number of drivers continues to increase and eventually tapers out to 0 once there are 80 drivers available, which indicates that there is no rider lost due to unavailable drivers once we have a supply of 80 drivers. The optimal number of drivers in this model is thus 80.

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In the advanced model (Figure 2, right), more factors are at play when drivers and riders are allowed mutual selection. Since riders have a choice not to confirm the request, a long wait time together with the unavailability of drivers can both lead to the loss of riders. In this graph, the optimal matching efficiency occurs at the intersection of two curves when there are 50 drivers available. We pick the intersection point instead of the point where the ratio tapers out to 0 because we want to minimize the number of riders lost while simultaneously maximizing riders' satisfaction by not keeping them waiting for a long time. The many practical considerations involved in our model allow for a more realistic decision of optimality conditions.
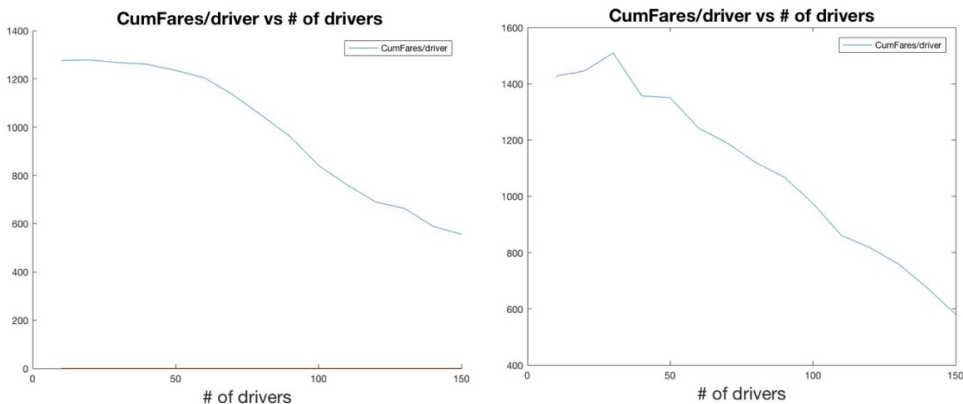

Figure 3: CumFares / driver vs # of drivers

The graphs above represent the relationship between cumulative fares that a driver can earn in a day and the number of drivers in the market.

In the basic model (Figure 3, left), we can see that as more drivers are entering the market, the competition for rides becomes intense. The daily cumulative fares that a driver can earn decrease due to a decrease in the number of rides he/she can possibly complete. Initially, when there is a deficiency in the supply of drivers, the fall in the number of drivers only results in a slight decrease in the cumulative fares that a driver can earn in a day since the large number of ride requests guarantees that every driver will get as many rides as he/she wants. As the number of drivers continues to increase, the competition gets fierce so that the money each driver can earn shrinks sharply.

In the advanced model (Figure 3, right), though the graph shows a trend that is almost the same as that in the basic model, we have found an interesting spike of the cumulative fares when there is a deficiency in the supply of drivers initially. The spike can be explained by a high surge multiplier, which is often associated with a large number of ride requests. When the surge multiplier is high a driver can earn more in a trip, which leads to a spike in cumulative fares. In addition, the curve in this advanced model is above the curve in the basic model, which shows that drivers are able to earn more when there are mutual selection and practical considerations involved.

We have also noticed that the cumulative fares are maximized when there is a supply of approximately 25 drivers, which is inconsistent with our previous finding of 50 drivers that maximizes the matching efficiency. We can see there is a conflict between the interests of Uber the company and Uber drivers. Further attempts can be made to resolve or reduce the conflict.

4. Discussion

Our model attempts to examine Uber's matching efficiency based on customer behaviors. We have made some interesting findings that are worth further analysis in the future.

Notwithstanding the findings presented here, our model still has room for improvement. We simulate the performance of Uber and the behaviors of drivers and riders in a 10 by 10 region. The data we take to build the model is a small sample that covers a short period of time in a limited region, while the actual popularity of Uber varies by region, time, and population. Additionally, price surge is assumed to be uniform across all regions; drivers are assumed to be insensitive to the distance from the last destination to their home; riders are assumed to use Uber no matter how close the destination is; and the rest time between two trips for a driver is assumed to be proportional to the amount that they work. In terms of human behaviors, there are always other factors that influence the decision made by a driver or a rider such as a driver's economic background, a rider's lack of alternative transportations, etc.

Some literatures suggest that a higher surge multiplier does not always motivate the driver to take the ride. Instead, a higher surge multiplier means drivers can earn the same amount of money faster. In reality, a driver may have a "cutoff" point where he stops driving soon after he has earned enough money for the day rather than having a gradually decreasing interest in driving. It is suggested that an increase in the surge multiplier may also lead to a decrease in the number of drivers available, which is not reflected in our model.

5. Conclusion

Overall, our model supports the idea that the surge pricing strategy that Uber adopts is doing a great job of improving the matching efficiency. However, the effects of surge pricing are not as clear as many people believe them to be. While a surge multiplier does calibrate the supply and demand in the market in a way that Uber benefits from, customer behaviors are simultaneously offsetting a great amount of the effects made by this surge multiplier. Therefore, it is important to further study the behavioral effects that are at play in order to stabilize the matching efficiency, reduce the number of riders lost, and improve the average salary of drivers. While we investigate data only on the Uber platform, our analysis and conclusion can be extended to other ride-sharing platforms as well.

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Gender Norms and Flight from Marriage

Sophie Li

Marriage rate in Japan has declined since 1990. We state that conservative gender norms within Japanese society strongly contribute to this phenomenon. By employing a theoretical model which links income to the probability of getting married, we show that men in a conservative society prefer women who work full-time at home to women who allocate time to both family and work, unless working women compensate men by earning an extremely high wage. Subsequently, we investigate the relationship between relative income and the distribution of housework within Japanese households using data from the Japanese General Social Survey. We find that wives who earn more than their husbands do significantly less housework, even though the amount of housework is not affected by income itself. Husbands who earn less than their wives tend to offer help, but the amount of help is not substantial. Our empirical analysis not only confirms the non-linearity between income and the probability of marriage, but also refutes the belief that working women do less home production.

1. Introduction

It seems that educated men and women in East Asian countries are marrying late or not getting married at all. Among the East Asian countries which share the experience, Japan leads the trend: approximately 20% of men and more than 10% of women never get married by the time they reach 50, according to the Japanese Ministry of Health, Labor and Welfare. Even though about 90% of never-married people in Japan still plan to get married, almost 70% of men and 60% of women among the never-married do not have any experience in dating. The situation is a calamity for Japan, because fewer marriages means fewer newborns and a shrinking labor force, making it more difficult to sustain Japan's aging population.

Why isn't marriage appealing to people in Japan, especially for the young and educated population? According to the 15th Japanese National Fertility Survey from 2015, more than 40% of women and men believe that the main barriers to marriage are money and places to live. Women are increasingly prioritizing financial stability when considering marriage and are therefore becoming more selective. More importantly, more and more women are unwilling to become full-time housewives and prefer to pursue their own careers. This violates Japan's historically conservative gender norms.

Gender norms are crucial to marriage market outcomes because they prescribe and reinforce gender-specific behaviors and expectations. For instance, traditionally, women are expected to be responsible for most housework, and men are expected to earn more than their wives. In this paper, we define gender norms as social rules regulating the division of labor in home production (such as cooking, doing laundry and taking children to school). Conservative gender norms state that married women should specialize in home production while married men should spend more time at the workplace. In contrast, liberal gender norms address the importance of equal distribution of domestic labor and equal

professional opportunities and roles for men and women. If gender norms are violated, people who violate them will experience a decrease in utility. This idea is similar to the notion of "gender identity" as described by Akerlof and Kranton (2000). As a result, conservative gender norms in Japanese society create an aversion for men from mating with highly-educated women because they believe that highly-educated women spend less time at home.

Considering that an increasing number of married women in Japan plan to manage both family and work (from 15% in 1992 to 28% in 2015) and an increasing number of single women plan to remain single and working (from below 10% in 1992 to 21% in 2015), we argue that Japanese men's preference of housewives over working wives contributes greatly to the decreasing marriage rate. However, we also state that men will marry working women with sufficiently high incomes. Our argument is supported by a theoretical model developed by Bertrand et al. (2016) as well as an empirical analysis using data from the Japanese General Social Survey (JGSS) from 2010-2012.

The theoretical model developed by Bertrand et al. (2016) explains why husbands in a conservative society (such as Japan) suffer from utility loss by having educated working wives. A working wife needs to earn an extremely high wage to compensate such utility loss, so the relationship between marriage and income for women is non-linear. We confirm the prediction of the model using JGSS data by exploring the correlation between the probability of getting married and characteristics of women and men. Income has negative effects for women and positive effects for men on probability of getting married, but income squared is positive and significant for women. As JGSS also collects responses to gender issues in the Japanese society, we include those variables in our analysis, and they strengthen the regression results even more.

Men prefer housewives because of the belief that housewives do more domestic labor than working wives. As a result, it is essential to examine whether the belief that working women do less domestic labor is correct. We examine the belief by empirically testing the relationship between relative income and frequencies of doing chores (such as cooking and grocery shopping) for Japanese husbands and wives. Unlike Bertrand, Kamenica and Pan (2015, BKP hereafter), we do not find that wives who earn more than their husbands compensate utility loss from violation of gender identity by doing more chores. On the contrary, we find that married women in Japan who earn more than their husbands do significantly less housework than other women. However, the amount of housework women do is not directly responsive to their own income, and women do most chores within the household in general. We conclude that men's beliefs about working women are only partially correct, and that men may be choosing the wrong reasons not to marry working women.

The next section offers a literature review regarding declining marriage rates in Japan. Section 3 gives a brief introduction of the data. Section 4 outlines a model which uses gender norms to explain the marriage gap between the highly educated women and the less educated women. We also perform empirical tests for the model in this section. Section 5 examines the relationship between relative income and amount of housework done by

husbands and wives in Japan. Section 6 concludes the paper. Appendix, tables and graphs are attached at the end.

2. Literature Review

Researchers have studied low marriage rates as well as low fertility rates in Japan for a long time, and several different hypotheses are offered to explain the phenomenon. Firstly, married women do significantly more housework than married men in Japanese society, so for women, getting married usually means spending more time on domestic labor and being less efficient in the workplace. The economic independence hypothesis suggests that educated women with a high earning potential are unwilling to enter "the onerous status of the Japanese wife and mother" (Tsuya and Mason 1995) because they can acquire more returns to human capital in the labor market. There is a steady and continuing decline in marriage rates because more women are becoming university-educated.

On the other hand, Raymo and Iwasawa (2005) raised the marriage market mismatch hypothesis, arguing that Japanese women "marry up" to maintain or improve their socioeconomic status. There is a shortage of suitable men when more women receive higher education, because both junior college and university-educated women aim for university-educated male partners. The marriage market mismatch hypothesis emphasizes women's financial dependence on their husbands while the economic independence hypothesis states the contrary.

Moreover, Brown and Lewis (2004) use lab experiments to show that men dislike being subordinate to their female counterparts. Their partner preferences are sensitive to the relative dominance of potential female mates. It might be the case that some men believe having a wife with a good education and high income may grant her too much bargaining power. It is plausible that men who marry working wives may receive a smaller part of a bigger pie, which makes them worse off comparing to marrying housewives who have very little bargaining power.

Both anecdotal evidence and research in sociology suggest that gender norms play an important role in Japanese marriages. To our knowledge, Bertrand et al. (2016) is the only paper which explains how gender norms affect marriage through an economic model. Thus, it is essential to use Japanese data to test the model and offer reasonable interpretations. Our research helps fill this gap.

3. Data

Survey data used in this paper come from Japanese General Social Surveys (JGSS), a Japanese version of General Social Surveys originally conducted by the National Opinion Research Center (NORC) at the University of Chicago. The surveys were conducted in Japanese, but English versions of the questionnaires, data sets and codebooks are available. We use the most recent results collected during 2010 and 2012.

JGSS allows us to elicit abundant information about the respondent, his or her spouse and children (if applicable). We have gathered data on characteristics of the respondents,

their education levels, occupations, working hours, wage levels, marital statuses, etc. We also have data on people's opinions of gender norms, such as whether one agrees or disagrees with the notion that "if a husband has sufficient income, it is better for his wife not to have a job." Please see the Appendix for a complete list of variables and survey responses we have used in this paper.

4. Marriage Decision

Bertrand et al. (2016) documented the marriage gap between skilled and unskilled women and argued that gender norms have been crucial in the persistence or reversal of the marriage gap. We will adopt the theoretical model proposed by Bertrand et al. (2016) to explain marriage decisions in a conservative society such as Japan. Furthermore, we use Japanese data to explore the correlation between probability of getting married and education level, income level and views on gender equality, so we can investigate whether it is more difficult for highly educated women to get married.

4.1 Model Setup

People get married because they prefer marriage to being single, so we say that agents should enjoy greater utility in marriage. We characterize agent i's utility function to be composed of three parts. The first part is agent i's public good consumption within the household, which is determined by agent i's wage and the number of working hours. The second part is the positive externality generated from agent i's partner j's private consumption. The positive externality relates to the gender norms within the society. Agent i receives more positive externality if there is more gender equality and j cares about i's career, and agent i receives less positive externality if there is more gender inequality. The third part of the utility function depends on the total amount of public good produced within the household and the share of the public good for each agent. The utility function of agent i with a partner j has the following form:

$$U_i^j = \max_{0 \le t_i \le 1} (1 - t_i)w_i + \alpha_i(1 - t_j)w_j + \beta F(t_i, t_j)$$

Here, t_k gives agent k's number of working hours, and w_k is agent k's wage. α_i measures the level of gender equality, which is only differs by gender but is fixed within a country for a specific gender. F is the function of public goods consumption, and the marginal utility of consumption is given by β.

Bertrand et al. (2016) assume that men are always more productive in the labor market than at home and that women have a comparative advantage in home production. Given these assumptions, Bertrand et al. (2016) summarize several properties of the utility function: 1. Men always work full time in the labor market. 2. If women's wages are lower than the marginal utility of public good consumption, women should work full time at home. 3. If women's wages are higher than the marginal utility of public good consumption, women need to allocate time between labor market and home production.

Note that by the third property, if a woman produces in the labor market and at home, she needs to compensate her husband's loss of public goods consumption by increasing the positive externality. The amount of compensation through positive externality varies by the level of gender equality within the society. When a woman cannot compensate her husband, the man will be better off if he marries a woman who works full-time at home. Therefore, when a society is more unequal, the wife will need higher wages if she chooses to work.

We create a graph to illustrate the relationship between a man's utility from marrying a working woman and the working woman's income (see Figure 1). Men will marry working women only if their utility is above 0. Figure 1 shows that working women do not need to earn a high income to be married in a more gender-equal society (green dashed line, α is high), but working women in a less equal society need to earn a sufficiently high income to "compete" with housewives in order to get married (blue solid line, α is low). The shadowed areas show where married women have more bargaining power in the household. Given the same level of spouse's income, married women in a more gender-equal society have more bargaining power (blue plus green area). This explains why men in a conservative society may be unwilling to marry working women, even though a working wife generates more income and pushes the household Pareto frontier outward. More bargaining power for the wife means the husband may be worse off in the share of household consumption despite the efficient allocation of resources (Chiapproni 1992).

4.2 Empirical Tests

We test this theoretical model by examining the correlation between marriage rates and education levels, income levels and views on gender roles. According to the model, given a fixed level of gender norms, more educated and higher income women are less likely to be married because men prefer women who can work full-time at home. However, the relationship between the probability of getting married and income is not linear. If the woman's income is high enough, she can compensate the man's utility loss and thus is also likely to be married.

The regression results from Table 1 confirm our expectation. For women (see columns 1-3), the coefficient of income is negative and significant, which implies that it is more difficult for women with higher incomes to get married. Our results are strengthened after controlling for occupation and number of working hours because the coefficient of income becomes more negative and significant. As the model predicts, the coefficient of income squared is positive and significant, which shows that the relationship between income and probability of getting married is indeed non-linear. If a woman earns a wage that is high enough, the man's loss of utility from less consumption of public goods within the household can be compensated through the woman's income. For men (see columns 4-6), income plays an important role in determining one's chance of getting married. A higher level of income can increase the odds by up to 20 percent. The coefficient of income squared is not significant, which implies that extra income does not have effects on men. It is also interesting to see that education plays no role in probability of getting married for women and has a slightly negative effect on men's chances of getting married. It might be

the case that more years of schooling prevent men from working and generating income, thus making them unattractive to women.

We also include controls about the opinions of gender roles in the specification (columns 3 and 6) because relatively liberal gender views may affect one's probability of getting married in a conservative society. In a separate table (Table 2), we document the differences in gender views between the junior college-educated and the university-educated. We expect differences in women's views between these two groups because junior colleges are known for producing "good wives and wise mothers" (Brinton 1988). As shown in Table 2, university-educated women tend to have more liberal gender views, especially regarding a woman's career and happiness. However, there is no significant variation in men's views. The fact that including more controls on the opinions about gender roles does not change the results significantly indicates the robustness of our specification.

4.3 Endogeneity

The reason for our argument of correlation instead of causation is that the regression on the probability of getting married suffers from an endogeneity problem. Income affects one's probability of getting married, but marriage also has great effects on income. Antonovics and Town (2004) have shown that marriage causes male wages to rise, possibly because married men are more productive in the labor market, or employers simply discriminate in favor of married men. On the other hand, marriage sometimes forces females to turn away promotions or even give up their careers because they need to take care of their husband and family. Using an innovative sex-mix instrumental variable, Angrist and Evans (1996) found that having children led many wives to leave the labor market, but husbands did not change their labor market behaviors. Female workers may also self-select themselves out of higher positions in the work force. As a result, women may have lower wages.

In addition, the survey data used for empirical analysis are far from perfect. People tended not to answer questions which relate to their and their spouses' income level, and we cannot rule out the possibility that they did so because the wife earned more than the husband. Namely, there is selection bias creating the potential for our results to be downplayed or exaggerated.

Ideally, experimental conditions would allow estimates without self-selection bias, and would allow researchers to find valid instrumental variables to establish exogeneity. However, in realistic, imperfect research like this, it is difficult to disentangle causality from correlation. That said, our results shed light on the non-linearity between women's marriage and income, and we expect exogenous estimates to yield stronger results.

5.   Relative Income and Home Production

We have established that men in a conservative society may be averse to marrying highly-educated women because the women's demanding jobs force them to spend less time on domestic labor. Now we turn to the investigation of relative income and home

production: are highly-educated, well-paid married women doing less housework? If that was true, then men would be justified in their decision not to marry them.

As established by BKP, relative income between husbands and wives greatly affects production within the household. By analyzing US data from 1970 to 2011 cross-sectionally, BKP found that wives who earned more than their husbands did more chores within the household, suggesting that doing more housework may compensate the loss of utility from violating gender norms.

We now examine relative incomes between husbands and wives in Japan. JGSS provides us with data about the respondent's and his or her spouse's income level and frequency of doing chores[1], so we can see whether higher income Japanese wives also do more housework. The empirical strategy is the following:

$$chores_i = \beta_0 + \beta_1 income_i + \beta_2 wem_i + \beta_3 edu_i + \beta_4 income_i {\times} edu_i + \beta_5 X_i + u_i$$

Dependent variable $chores_i$ is binary, with 1 indicating doing chores almost every day or at least several times a week, 0 if otherwise. There are several main explanatory variables: income level $income_i$, whether the wife earns more than the husband wem_i, education level edu_i and the interaction term between income and education. wem_i is binary and equals to if the wife earns more than the husband. Due to the nature of the survey questions, we can only distinguish wives whose wages are strictly one level higher than their husbands'. If the wife and the husband are in the same wage bracket, we cannot tell who earns more in the household[2]. Education is classified into three groups: high school graduates and below, junior college (two-year college) graduates, and university graduates and above. Interaction terms are created correspondingly. We also include a list of controls X_i in the regression, which shows agreement or disagreement on specific gender issues, such as whether happiness of women lies in marriage or whether working mothers have negative impacts on children.

Regression results are shown in Table 3. We use a Probit regression because dependent variables are binary, ranging from 0 to 1. Panel A shows regression results for married women, and panel B shows results for married men. By analyzing results in Panel A, we find no evidence that wives who earn more do more housework to compensate the loss of utility due to violation of gender norms—quite the opposite, in fact. Married women who earn more than their husbands do significantly less housework, even though the amount of housework is not responsive to income. That said, Japanese wives, rather than husbands, are the ones doing most of the housework, since the mean frequency of doing chores is close to 1. On the other hand, panel B indicates that married men who have higher income levels are justified to do housework less frequently, because coefficients of income for all types of chores are negative and statistically significant. Husbands who earn less than their wives tend to help with chores, but the amount of help is not substantial.

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[1] JGSS offers respondents multiple choices to let them choose their income level instead of filling in manually. A sample choice is "between 3.5 million - 4.5 million yen per year." Similarly, questions about frequencies of doing chores are multiple choices as well. A sample choice is "Almost every day."

[2] Suppose the wife earns 5.2 million yen per year while the husband earns 4.6 million. Their wages will both be classified as "between 4.5 - 5.5 million yen per year" and we cannot conclude the wife earns more in this case.

The mean frequency of doing chores is low for men. We use a graph with discontinuity to illustrate how relative incomes affect the amount of chores men and women do (see Figure 2). Suppose the spouse's income is a tipping point; here, we show that female home production is not largely affected by income but experiences a discontinuity with a big gap at the tipping point. Male home production is always responsive to income, and the jump at the discontinuity is small.

Furthermore, we compare frequencies of doing chores for married women and men by education level in Table 4. We only examine junior college-educated and university-educated people because they are the groups of interest. There are different frequencies of doing chores for junior college-educated women and university-educated women, and the latter do less housework. That said, the magnitude of the differences is not substantial, and women in general do much more housework than men. There is virtually no difference in the frequencies of housework between junior college-educated men and university-educated men.

It seems surprising that the amount of housework a married woman does is significantly affected by whether she earns more than her husband but is not responsive to income and education. It might be the case that married women can have more bargaining power only if they earn more than their husbands. Moreover, husbands who earn less than their wives do not offer much help. We make an educated guess that wealthy families may be able to outsource domestic labor (e.g. hire a housekeeper) so that neither the husband nor the wife needs to do much housework.

6. Conclusion

We use a theoretical model from Bertrand et al. (2016) to explain why it is less likely for educated and higher income women to be married unless their wage is high enough to compensate men's utility loss. The empirical analysis confirms the non-linear relationship between marriage and income. We also observe that married women are the ones doing most housework within the household regardless of their education and income levels, except for the case in which women earn more than their husbands. The phenomenon of unequal distribution of home production has nuanced historical roots, and we argue that conservative gender norms derived therefrom contribute greatly to the phenomenon.

Bertrand et al. (2016) state that even if gender attitudes could not change drastically in conservative societies, educated women would eventually become more attractive in the marriage market with more improvements in the labor market. Doepke and Tertilt (2009) have similar hopes, as they found that men were incentivized to contribute to women's liberation because they cared about their daughters as well as investment in children's education. Moreover, a formation of family between educated men and educated women enables the family to enjoy a high income. Educated parents also tend to provide their children with a good education. With more private and public goods within the household and greater investments in children, both men and women should gain utility from marriage (Chiapproni et al. 2017).

Since we have discussed that endogeneity prevents us from reaching a causal argument, future works on the causal relationship between gender norms and marriage can start from the following two ideas:

1. Employ multiple waves of JGSS or other survey data to create a panel data analysis. It would be optimal for researchers to use panel data on women's wages to observe how wages change due to marriage and child-bearing decisions. More data will also increase the robustness of the results.

2. Even though we assume gender norms are fixed within a society, males may have heterogeneous preferences for their partners which go against the mainstream gender norms. For instance, Fernandez et al. (2002) found that men who have working mothers are more inclined to marry educated and working women. Future researchers can examine the differences in marriage trends between people who have working mothers and people who do not.

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Understanding Incentives for German Foreign Direct Investment in Sub-Saharan Africa

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Germany, the 4th-largest economy in the world, has grown from being the recipient of development to becoming a significant contributor to international development efforts. The German government has laid out plans for a "Marshallplan mit Afrika" (Marshall Plan with Africa) that seeks a greater focus on private investment. This paper builds up a historical construction of Germany's current approach to development assistance in Africa and critically examines current German development plans. Dunning's OLI Paradigm was used to guide the analysis and consider firm-level motivations for investment in Africa. Conducting a regression sought to determine which factors are most significant when taking investment decisions. Finally, this paper proposes and examines policies that can stimulate investment in light of these considerations.

1. Introduction

The German government, in the past year, has detailed plans for a new development policy regarding Africa. The focus will shift to foreign investment away from direct aid and is targeted at sustainable development that has long-term fixes. Is stimulating foreign direct investment (FD) an effective way to achieve growth indicators and what drives certain spillover effects? The literature suggests that one of the main channels in which FDI affects long-run growth is providing more productive technology to target firms and countries through technology transfer.

How does the German domestic context inform its economic relations? The German economy displays many unique economic characteristics that inform how German firms invest in the world economy. Risk aversion is present in German economic behavior and extends to foreign direct investment decisions taken by German firms. German plans for sustainable development in Africa will be benefited by raising barriers to foreign direct investment from German firms. The planned reforms to the Hermes credit investment guarantees are necessary to attract greater investment from small to mid-size firms that make up the large majority of German firms. Since manufacturing costs in Africa are not significantly lower than other regions, it is expected that German FDI is focused on gaining new markets for German firms rather than seeking to lower manufacturing costs.

Germany's increasing role in international development can also be seen from the lens of Germany's lack of hard power and focus on soft power. The German economic and international relations context must also be understood in order to analyze approaches to foreign investment. Considering Germany's economic might; it is slightly puzzling to see a lack of investment in Africa.

German firms have until now been reluctant to invest in Africa due to concerns over institutional quality and a lack of investment guarantees. This view will be supported by analysis of historical and current relations along with current German development policy

and the German investment contexts. Historical conditions and economic incentives create the current investment environment.

2. Historical Overview of German Relations with Africa

The relationship between Germany and Africa has often been politically fraught and exploitative. Germany was unique among major Western European empires in not having participated in the Atlantic slave trade. Though Germany had long been a hub of European trade due to its advantageous position in the center of Europe; the German kingdoms remained largely separate and German-speaking people scattered (Evans 2014).

After unification in 1871, the German public desired a German colonial empire in order to gain the accompanying prestige and compete with the dominant British and French empires. Bismarck personally opposed colonial possessions at first but was convinced by its political expediency by 1884 (Henderson 1935). From November 1884 to February 1885, the European powers divided up Africa at the Berlin Conference organized by Chancellor Bismarck. Germany managed to claim the most territory after Britain and France; colonizing modern Burundi, Cameroon, Namibia, Rwanda, Togo, and Tanzania. Though all but two colonies (Togoland and German Samoa) were not self-sufficient, the German state continued to fund its colonial empire for reasons of prestige.

In their colonies, German authorities embarked on technocratic development that built infrastructure such as rail lines. This view of development placed an emphasis on central planning and forced development; mainly at the expense of native peoples' political liberty. Colonial powers in Africa asserted that their technocratic ability could "civilize" the Africans and this view was not exclusive to German officials. The German colonial authorities, as with other European colonizers of the era, had racist perceptions of the local people and viewed their development mission as civilizing *unsere braunen Schützlinge* [our brown charges]. The misguided paternalism that characterized Western colonial policy can be seen in these sentiments. German colonialism left a short but brutal impact in Namibia with racist, nationalist sentiments leading to a genocide of the native Herero tribe. Germany has not focused on its colonial relations and has not officially apologized for the Herero genocide; hurting its image in Namibia (Kössler 2015).

German colonial policy focused on extractive institutions such as taxation that forced people to work as de facto slave labor in order to pay them off. The debate between extractive and inclusive institutions and their influences on development has been explored by many scholars since its introduction by Acemoglu, Johnson, and Robinson (2001). Extractive institutions are controlled by a small segment of the population who design the institution so that they can profit. Mizuno, Naito, and Okazawa (2017) show with a model of citizen and leader utility how great inequality in a society can increase the likelihood of extractive institutions forming.

3. Current German Economic Relations with Africa

German firms are increasingly eager to invest abroad but are targeting more advanced emerging economies than those that are present in Africa. German companies have historically not had a large presence in Africa. According to Gerd Müller, Federal Minister of Economic Cooperation and Development, only around 1,000 of the largest 400,000 multinational German companies have operations in Africa (Müller 2017). German investment in Africa at present is not equally distributed and ranks behind that of other EU members. In 2015, German ranked 8th in capital investment into Africa and 5th in number of projects. (See Appendix 1 for map of investments)

Today, Germany has particularly deep trade relations with South Africa. Germany was the second-largest exporter to South Africa in 2016. Its exports to South Africa dwarf that of the UK's. However, South Africa runs a large trade deficit with Germany; reaching 2,984,036,087.89 euros in 2017. This has drawn some inflammatory rhetoric from South African politicians. In addition to trade, German firms also make South Africa their destination of choice if they invest in South Africa. The IHK, a German chamber of commerce, has an online directory of firms investing in Sub-Saharan Africa. 311 out of 724 firms invest in South Africa; demonstrating the strength of that particular relationship.

According to Euler Hermes, who provide export credit and investment guarantees (known as *Hermesdeckungen* or Hermes Covers) to German firms investing abroad, the largest export targets in Africa are South Africa, Nigeria, Angola, Ghana, and Kenya. The largest targets for recipients of Hermes Covers are South Africa, Kenya, Ghana, Uganda, and Nigeria. Other large partners for investment include the Democratic Republic of Congo and Angola; two countries with notable natural resource endowments.

4. Economic Theory Regarding Foreign Direct Investment

FDI, as defined by the United Nations Conference on Trade and Development (UNCTAD), is an investment made in order to gain a financial interest in an enterprise operating outside of the investor's economy. 10% of equity ownership is recognized as a benchmark for an investor to be a foreign direct investor.

The Heckscher-Ohlin (H-O) theory, deriving from the Ricardian model of comparative advantage, suggests that countries export goods that employ abundant and cheap factors of production and import products that require the use of scarce and therefore expensive factors. However, the H-O model has not always held up under econometric testing as it has low predictive power. It works well as a way to conceptualize trade but then must be deepened.

The Linder Hypothesis (1961) attempts to resolve the failure of the H-O model in explaining trade between rich nations by asserting that the more similar two countries' preferences and factor endowments are; the more they will trade. In essence, consumers with high income demand high-quality goods. Economists Fajgelbaum, Grossman, and Helpman (2011) found that the Linder Hypothesis holds for horizontal FDI, investment

that seeks greater market access. FDI is more likely to occur between countries with similar per capita income levels. The nature of this investment is more like to take the form of a foreign subsidiary the closer the target economy is in characteristics to the home economy.

The gravity model of trade models trade as a function of distance D and economic mass M of countries i and j.

$$F_{ij} = G \frac{M_i^{\beta_1} M_j^{\beta_2}}{D_{ij}^{\beta_3}}$$

As D increases in the denominator, F (representing trade) falls. Equivalent large values of M decrease F. Borrmann, Jungnickel, and Keller (2005) extended the gravity model to German FDI to Central and Eastern Europe after the fall of Communism and suggested that this model holds true for this case of FDI as well as trade.

The Eclectic Paradigm, also known as the OLI (Ownership, Location, and Internalization) Framework is a framework developed by John Dunning that is the standard economic theory used to explain foreign direct investment. Though firm decision-making is on the micro level, they take macroeconomic factors into account when choosing whether or not to invest in a target country. OLI's weaknesses are that it mainly explains "greenfield" FDI where firms set up a branch in another country. However, it can be extended to cross-border mergers and acquisitions which make up the majority of current FDI.

O: Firms derive advantages from ownership being located in a certain country
>Ownership characteristics are the firm's characteristics. This explains why firms from developed, productive economies engage in FDI. They have the expertise or technology to provide a certain advantage in the target country. Only the most productive firms engage in FDI.

L: Firms derive advantages from starting operations in another country
>Location advantages are similar to comparative advantage in the Heckscher-Ohlin model that builds on the original concept created by David Ricardo.

I: Firms choose between internalizing operations or subcontracting out
>Firms choose to organize their operations and have the choice of keeping ownership within the firm or engaging with the market to find a subcontractor.

The Eclectic Paradigm is a standard framework for conceptualizing studies of foreign direct investment; but it has been criticized by other scholars. Buckley and Hashai (2010) create a formal general equilibrium model that addresses some of the issues with the eclectic paradigm. Dunning's original theory does not explore specific relations between the three branches. Therefore, it can be suggested that a lack of one of these advantages will lead to a lack of investment. However, their mathematical model instead models these advantages as continuous variables that affect the probability of MNE investment.

Multinational firms must pay a cost premium of $1 - te_{f,AB}$ that represents disadvantages due to being less familiar with the local market than domestic firms.

FDI can also be divided into horizontal and vertical FDI. Horizontal FDI is focused on seeking greater market access while vertical FDI seeks cheaper manufacturing costs. The literature suggests that multinational firms invest abroad when they can lower production costs and improve market access. Buch, Kleinert, Lipponer, and Toubal (2005) suggest that much of the literature supports market access being the dominant factor. Helpman, Melitz, and Yeaple (2002) created a general equilibrium model that demonstrated how only the most productive firms engage in FDI. Lower income countries with less-productive firms will not engage in FDI.

5. Africa's Need for Investment

Africa has suffered historically due to a variety of factors chiefly including extractive colonial powers asset-stripping while paying an utter disregard to building equitable and just local institutions. However, Africa is not a continent of war-torn, disease-ravaged dictatorships that it is often stereotyped to be in Western media. These perceptions can damage investment prospects and discourage investment in regions that are in fact stable with economic potential. Optimism can be found all over Africa. Botswana has been a multiparty democracy since independence in 1966. Fintech startups such as Mpesa in Kenya and Tanzania are models for inclusive solutions that empower the poor.

There exists tremendous potential within Africa and much of this potential requires investment to unlock it. Africa's population growth is booming and projections by the UN show Africa (with 1.256 billion people in 2017) having a population of 1.7 billion by 2030 and close to 4.5 billion by 2100 (UN Department of Economic and Social Affairs: Population Division 2017). 60% of the global population increase between 2017 and 2050 will occur in Africa. The graph below shows how Africa is expected to eventually converge with Asia and far outstrip Europe's population. Massive markets will grow for investment and there is the potential to aid billions of people in reaching their full potential. From a human capital perspective, this massive population growth can be a tremendous boon if African economies and political systems are stabilized.

Continental Population Projections
2017-2100
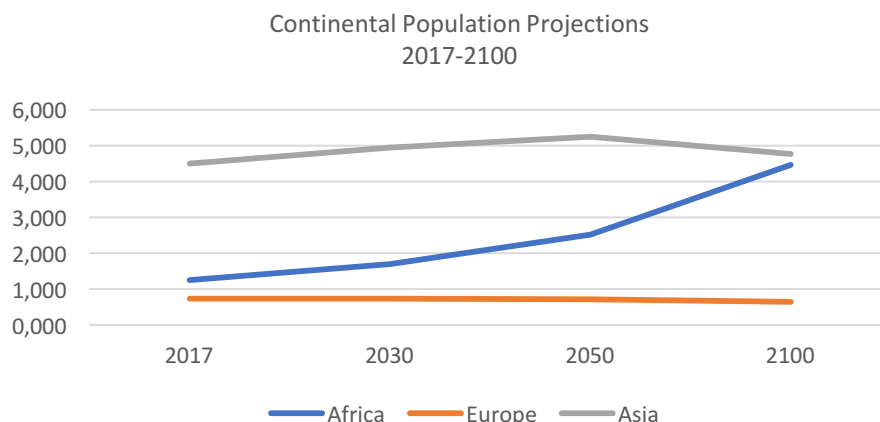
Source: United Nations, Department of Economic and Social Affairs, Population Division (2017).

However, there are a variety of metrics that demonstrate how Sub-Saharan Africa is currently not living up to its economic potential. GDP per capita in many nations has regressed since colonial times. Economic literature widely supports the theory that FDI is beneficial to economic development. Foreign investment can aid the process of economic diversification away from natural resources. Domestic industries lack the technical knowledge or capital necessary to expand. Countries such as Nigeria are reliant on commodities such as oil that have volatile prices. Much of the growth for African countries abundant in commodities in the past two decades was due to China's insatiable demand for commodities as its economy boomed and demanded inputs. As China's development path progresses into that of a developed country that is gradually shifting away from its manufacturing base towards a knowledge-based economy, commodity demand has fallen and this has had negative effects on the GDP in many African countries. Manufacturing industries across the African continent have failed to take off. However, there is little possibility at present of African countries following Germany's own economic model which relies on low manufacturing wages. African wages are relatively high, especially compared to those in Asian countries such as Bangladesh, and preclude vertical FDI that seeks to minimize labor costs. Nevertheless, FDI has many potential upsides for Sub-Saharan African countries.

Large multinational firms share knowledge with target countries when they engage in FDI. However, research suggests that large gaps in technological capacity make these knowledge spillovers more difficult. Pfeiffer, Görg, and Villar (2014) found that European FDI benefited Sub-Saharan African firms in a vertical spillover sense in increasing productivity. These productivity benefits were more keenly felt the greater the African firm's absorptive capacity was. They found that investment from Sub-Saharan Africa resulted in the largest increases marginal productivity, supporting the contention that investors from similar economies with similar tech levels have the greatest effect.

Technology transfers are also important to consider when evaluating the positive impact of FDI. Firms can be mandated by the host country to share the technology used in their venture. Borensztein, De Gregorio, and Lee (1998) found that FDI contributes to economic growth through the channel of technology transfer. In their model, based on

Romer's (1990) model of endogenous economic growth, foreign direct investment works to lower setup costs. They also found that recipient countries must have sufficient absorptive capacity. This supports other research mentioned above that finds that greater technology differences between two countries and firms leads to smaller tech transfer effects. FDI spillovers are treated as further inputs that explain total factor productivity (TFP). Most notably, China was able to leverage strict tech transfer requirements for foreign firms looking to establish joint ventures. Chinese firms were able to adapt more advanced technology and knowledge from firms with greater expertise and adapt the technology for their own uses. German firms have prospered due to high levels of technological attainment and this has benefited productivity. Though high-tech goods may not currently be in high demand at present in Africa, technical investments have great potential within certain sectors such as agriculture.

There exists a need for FDI in non-extractive industries. For example, China's increasing FDI flows into Africa over the past two decades have drawn much attention in the development community. Much of Chinese FDI is motivated by the desire to control the production of resources such as essential minerals used in electronics production. In order for FDI to have an impact on development outcomes such as education and health, investment in schools and hospital projects is necessary. Foreign investment can also be beneficial in delivering large infrastructure projects.

There is a clear alliance of interest between African countries and Germany. Increased demand for manufactured products from an ever-increasing middle class is a boon to German manufacturers. Boosting African development has significant benefits for Germany in providing jobs for export-oriented industries. The multiplier effects of development assistance have net positive effects for the German economy. German firms benefit from improving business climates in emerging markets and can find new markets for their goods.

6. German Development Policy

German development policy has suffered from a lack of a cohesive focus and varying approaches. *Verantwortungspolitk* (literally "responsibility politics") is a leitmotif in German foreign policy that derives from official government acknowledgment of responsibility that Germany has in the two World Wars (Crossley-Frolick 2017). In keeping with this policy, Helmut Kohl's post-reunification government had set gaining a permanent United Nations Security Council seat as a goal (Maull 2006). Providing development aid was seen as necessary in order to gain influence abroad; therefore, the major parties all agreed to de-politicize development aid in the period. However, at the advent of the grand coalition between the left-wing SPD and the center-right CDU/CSU in 2005, German development policy lacked a cohesive focus (Crossley-Frolick 2017). Economic development was not explicitly recognized as a way to ensure peacebuilding and deter conflict. This differs from the perception in the current government brought on by the growing refugee crisis and exodus of people from Africa to Europe.

Kappel (2017) noted the diffusion of power among the various ministries and its subsequent negative effects on project efficiency. Friction costs and delays due to bureaucratic machinations hinder projects. Maull (2006) also noted how the Foreign Office and the BMZ released differing plans for African development policy in 2001. The following institutions have the most influence on development policy and focus on differing areas.

Instruments

- The BMZ (*Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung* - Federal Ministry for Economic Cooperation and Development) is a ministry at the cabinet-level. It was formed in 1961; incorporating various powers and competences from various other ministries. The BMZ sets overall policy but actual implementation is often undertaken by various other institutions. It is not solely responsible for all development programs as ministries such as the Federal Ministry for the Environment are responsible for certain programs related to environmental sustainability.
    - Around two-thirds of German ODA comes from the BMZ
- The KfW (*Kreditanstalt für Wiederaufbau*" - Reconstruction Credit Institute) is the primary German development bank. It is also the third-largest bank in Germany and provides many services in order to aid domestic economic development.
    - The KfW is a provider of export-credit guarantees
    - The KfW is currently involved in numerous technical assistance programs in Sub-Saharan Africa.
- The other arm of the BMZ is the GIZ (*Gesellschaft für Internationale Zusammenarbeit* – Corporation for International Cooperation). It is a relatively recent creation; a merging of three development agencies in 2011.The GIZ operates on the behalf of the BMZ but also works with other agencies such as the Federal Foreign Office on specific projects.
    - GIZ focuses on technical and advisory solutions
    - GIZ rhetoric is centered around "security"

7. **German Orientation in the Global Power Structure**

Germany has reoriented itself as an economic power and its complex trade interdependence due its status as a major exporter colors its international relationships today. A reliance on exports means that German economic interests are reliant on peace and stability in foreign markets. German hard power is often characterized as lacking compared to other major economic powers but Germany does retain significant military power; especially in comparison to surrounding EU states. Since reunification, Germany has been a regular participant in peacekeeping missions around the globe. However, troop numbers remain small and the rhetoric surrounding these missions remains cautious.

Germany is not a true great power as it eschews hard power. Germany lacks a strong navy that has the ability to deploy significant power abroad. The term "blue water navy" describes navies that are able to project power globally. As a small regional force with its largest ships being frigates and no aircraft carriers, Germany's navy focuses on domestic

defense and contributing ships to multilateral peacekeeping missions. Much of German military equipment is outdated and poorly maintained; damaging the ability of the Bundeswehr as a fighting force. German caution over exertion of power derives from its violent past. Modern German culture does not honor military service and views the military with distrust; again, due to historical construction. Though Germany has often been lauded as a great defender of liberal "Western" values; especially in light of the turn towards backwards-facing populism across Western Europe and the US, the German government is at best a reluctant defender. Ulrich Krotz (2015) compares Germany to France; a country with a similar population and resources. Compared to France, Germany participates in far fewer hard power initiatives and lacks domestic sentiment that inspires international intervention.

German has regional hard power but exerts global economic might. German foreign policy rhetoric refers to the country as a *Friedensmacht* or "force for peace". German ODA ranks the 3rd-most in the world; after the US and UK. The refugee crisis has led to a large portion of German development assistance funds going towards refugees within Germany. Germany integrated itself into international organizations and agreements such as NATO. Integrating itself in multilateral projects allowed it to act as a partner in peacekeeping efforts without assuming the center stage. Germany is today a major target for inward FDI flows due to a variety of factors including its large economy, central location in Europe, and reliable infrastructure and institutions. Modern Germany exerts tremendous economic power the EU and has an extensive dependence on the EU as well. The German government is one of the foremost promoters of deeper integration into the union. Much of German trade and investment is concentrated within the EU as firms take advantage of the customs union and Germany's central location. Therefore, it can be seen how policies promoting economic power through investment are in German best interests.

8. German Economic Context

The German government has an incentive to promote peaceful economic interdependence as the German is heavily reliant on exports. The alternative of reducing export dependence requires severe structural adjustments to the economy and means that export dependence will continue despite resentment from trading partners over trade deficits.

The Case of German FDI in Post-Communist Transition Economies

The case of German investment in the transition economies of Central and Eastern Europe is relevant as German firms were investing in markets that had been hitherto largely untapped. Buch, Kleinert, Lipponer, and Toubal (2005) found that FDI decisions by German firms investing in Central and Eastern European transition economies were influenced by institutional reforms and by the difference in relative factor endowment. This supports two parts of the OLI framework; that firms value decreased political risk and that FDI on the macro level is increased by differences in factor endowments.

The *Mittelstand* is a term referring to the small and medium-sized enterprises (SMEs) that comprise the backbone of the German economy. Söllner (2016) found that SMEs make up relatively small shares of overall exports compared to large, multinational firms and their exports are largely confined to one country. SMEs prefer to build up a comfortable trading relationship in one country.

Despite their prominent status in the German economy, the majority of German SMEs do not choose to invest abroad. Only 4% of SMEs participated in FDI between 2012 and 2015; according to a report by the KfW. However, this differs on a sectoral basis and manufacturing firms are more active than non-manufacturing ones (Wocher 2017). The vast majority of SMEs use their own capital to fund investment with only 12% using bank loans. Larger firms do rely on external financing and this is posited to occur due to larger investments and larger potential returns being more attractive to investors. SMEs in Germany also typically do not rely on capital markets for finance; instead relying on one bank over a long period of time (Van Der Putten 2016). Capital spending overall has been low with investment at 10% of GDP but this reflects the trend in other OECD countries.

If SMEs do invest, the KfW found that they preferred to invest in other EU countries. The EU single market makes investment simple legally and EU countries generally have a high level of institutional quality. The largest destination for German FDI outside the EU is China. The KfW notes rising manufacturing costs in China and suggests that German investment in China is now driven by a desire to sell to the massive Chinese market. This is a hallmark of horizontal FDI.

Underpinning the strength of German exports are low labor costs and a strong emphasis on co-operative industrial relations. Unions are powerful and maintain good employer-firm relations. Employees involved in export industries prioritize job security over high wages. Germany has a corporatist system that features cooperation between firms, labor, and the government. Firms are subject to heavy regulation that ensures job security for workers but can keep wages low due to a compact with unions that stresses employment over wages. Wages in key exporting industries are homogenous on a firm-by-firm basis; therefore, workers are also incentivized to stay put.

Germany's export-oriented model has meant that consumer spending is low as relatively low wages deriving from union-corporation cooperation constrict spending. Germany's account surplus was 8.6% of GDP in 2015; reaching this high on the back of household and firm saving (Van Der Putten 2016). An excessive focus on saving and not investment can harm German growth prospects; especially with the risk of a rapidly-aging population decreasing the amount of human capital and putting pressure on infrastructure and social security nets.

An aging population also means that German firms are facing increasing incentives to invest abroad in countries with rapidly growing populations. This is where Africa, the

continent projected to have the largest population by 2050, can position itself as a key partner for German firms looking to engage in horizontal FDI.

9. The "Marshallplan mit Afrika"

West Germany was aided in its reconstruction efforts after World War II by the American Marshall Plan; the namesake for Germany's current foreign and development policy regarding Africa. The term "Marshall Plan" has come to be used as a description for large-scale economic recovery programs. American interests were guided by ensuring that Europe remained stable despite the widespread poverty and destruction that existed after the war. The amount of aid disbursed does not correlate directly to the pace of recovery in targeted countries. West Germany received less aid than the UK and France but recovered quicker. Nevertheless, the plan was overall a positive contributor to postwar European development.

The revisiting of the Marshall Plan in the plan's title is ironic as the current plan differs greatly in practice from the original. The original Marshall Plan focused on direct disbursement of funds to governments. It succeeded to strong governance structures that managed to survive the war. Strong governance and inclusive institutions are not present in many of the target countries today. Direct disbursement of funds has been shown to enrich the personal wealth of corrupt officials and not help those truly in need. Foreign aid disbursed to public sector actors leads to corruption and inefficiency; as has been documented by many scholars. Though research shows that aid has a potentially positive net impact; aid suffers from a lack of enforcement mechanisms. Aid agencies have also displayed myopic tendencies in ignoring country-specific factors (Easterly 2003).

As per mainstream development thought moving away from no strings attached loans or grants towards more nuanced models of investment, Germany's Marshallplan combines different theoretical conceptions of development aid. The plan eschews official government assistance in favor of promoting private investment. Though this plan is a nascent stage, it has the potential to firmly shift development strategies away from foreign aid towards promoting investment. The plan deepens the debate between government assistance and private sector investment. An emphasis on listening to African policymakers and solutions has the potential to solve the time-old issue of foreign experts emphasizing broad-based reform that does not take country-specific contexts into account.

A potentially skyrocketing African population boom coupled to stagnating economies with high unemployment could lead to even more Africans seeking to emigrate to Western Europe; particularly Germany. This plan has also been spurred by the migration crisis in Europe. As the country bearing the brunt of the migration surge, Germany has been looking for solutions. The "Marshallplan mit Afrika" is an attempt to tackle the root causes of migration spurred by a lack of economic opportunity. Rather than a purely altruistic measure, it reflects political pressure put upon German policymakers.

Policy initiatives on the part of the German government in order to achieve this goal must account for the incentives and drawbacks faced by firm. Kappel (2017) critiques how the plan mentions values-based investment but proposed partnerships with autocratic

regimes such as Ethiopia continue the issue of development assistance being utilized to oppress citizens.

10. Risk and Investment Guarantees

German investment is often characterized as risk averse with a survey of institutional investors in 2016 showing that 82% of investors had "avoidance of losses" as their highest priority. German foreign policy can also be described as risk averse in that hard power interventions are opposed by the general public. For example, only 7% of respondents in a survey about attitudes toward the French military intervention in Mali supported sending German soldiers.

German firms are sensitive to political risks as well as commercial risks. Current investment guarantees include nationalization, acts equivalent to expropriation, war, moratorium, convertibility problems, and transfer issues (Huber-Saffer 2015). Investment projects in Sub-Saharan African countries are subject to an array of risks. Often subpar infrastructure means that factories and offices will be left without power. German banks also display aversion to financing investment in risky markets. The problems of asymmetric information and moral hazard prohibit private insurance firms from providing insurance. The state, with its larger economies of scale, is able to better absorb insurance claims. When it comes to the issue of political risk, the insured party does not have an advantage over the insurer since political risks are endogenous factors.

Government support can mitigate the level of risk present in markets with political instability. In order to mitigate the risk from exporting to unstable markets and encourage exports overall, German firms are offered export credit guarantees along with investment guarantees. The federal government provides a guarantee of funds in the case of severe political or credit risk. Euler Hermes Kreditversicherungs AG is a credit insurance firm authorized by the German government to provide credit to firms looking to export goods to risky markets. Euler Hermes is the largest trade insurance provider in the world. Currently, a consortium of PricewaterhouseCoopers and Euler Hermes manages German export credit and investment guarantee schemes. The Federal Government underwrites these schemes and sets limits for the maximum liability. In order for ambitious plans to boost private investment to work, the German government must stimulate investment from SMEs that hitherto have felt that they cannot take on the level of risk necessary. Klasen (2014) found that firm size had a negative effect on corporate insurance demand; suggesting that smaller firms are more susceptible to risk.

11. Regression Analysis

The following regression is conducted in order to test the hypothesis that German firms are reluctant to invest in African countries due to an aversion towards political risk. The OLI framework discussed earlier is applied to build a picture of various incentives driving potential German investment in Sub-Saharan Africa. Assumptions incorporated into the literature concerning investment are tested by this analysis. Care had to be taken

when choosing variables as many of the countries in question do not have adequate statistical records.

The wide expanse of literature examining the determinants of FDI is split over the precise makeup of the determinants. Therefore, researchers have chosen slightly different variables when examining this topic. The variables chosen in this study were based on common variables and ones that have specific relation to Sub-Saharan Africa. The OLI framework does not suggest specific variables but these are based on common model specifications in literature analyzing FDI flows. The following model is specified:

$$FDI = \beta_0 + \beta_1 MARKET - \beta_2 INF - \beta_3 EXCH + \beta_4 OPEN + \beta_5 RISK + \beta_6 RESOURCE + \beta_7 COL \quad (1)$$

The dependent variable is FDI outflows from Germany to the target country. Data is only available until 2012 from the OECD. Bundesbank data lumps together investment in Africa; not distinguishing by country. FDI inflows from Germany to certain African countries was negative during certain years in the time period. This means that divestment occurred; meaning that firms reclaimed their investment. For example, investment into Nigeria from 2006 to 2008 is negative. A 5-year average from 2006 to 2010 is constructed in order to lessen the impact of values of 0 and divestment.

The following variables are chosen with theoretical justifications:

L Factors – These factors affect what location firms choose to base their overseas investment in.

Market Size
Market size has consistently been used in regressions testing levels of FDI (Chakrabarti 2001). It is supported by the economic theory of economies of scale. Larger economies exploit economies of scale and are more productive. Wealthier markets will also exhibit overall higher aggregate demand for produced goods and services. GDP per capita is used as a proxy for market size.

Exchange Rate
The exchange rate affects FDI by making investment cheaper. A higher exchange rate means that the currency in the target country is cheaper relative to the host currency's value. These are obtained by finding the exchange rate of each currency relative to current US dollars and then converting to euros.

Openness
The standard way to measure the openness of a country's economy is to use the following formula:

$$Openness = \frac{(Exports + Imports)}{GDP} \quad (2)$$

Small countries will tend to have higher values by this measure since firms cannot rely solely on small domestic markets as opposed to in large countries where much

of trade is internal. Greater openness would mean greater investment as it signals receptiveness.

Colonial History

A weak positive relationship between a dummy variable testing colonial history or not and FDI is theorized. A dummy variable with values 0 for lacking colonial history with Germany and 1 for having that history is created in order to test this.

Growth

High levels of GDP growth theoretically will mean higher FDI inflows as a rapidly growing economy has greater opportunities. Growth also implies the accumulation of capital that is part of the investment process. Therefore, a positive coefficient sign would be expected.

I Factors – In order for factors to affect internalization, they must be related to whether or not the firm establishes a foreign subsidiary. If assets are based in a target country, then they are at greater risk.

Political Risk

Political risk has effects on the extent to which firms internalize their operations in a target country. If a high level of political risk is present, firms will decrease their investment. A higher risk of expropriation is expected to drive down investment. Due to a lack of historical data on expropriation risk, the Regulatory Quality indicator from the World Bank Governance Indicators dataset was used. This index measures how well the government formulates fair policies that encourage investment. In a country with a high risk of expropriation of assets; this value would be expected to be lower.

Inflation

Inflation has the potential to wipe out gains from foreign investment as the value of a currency decreases. Sayek (2009) models inflation as a tax that has impacts on a multinational firm's home and target markets. Inflation in a foreign market is expected to make firms substitute away from foreign investment towards domestic investment. A negative sign is expected as higher inflation scares off investors.

Natural Resource Endowments

Internalization is crucial for ensuring that control is retained over natural resources (Buckley 2007). Though this fits more with the Chinese model of FDI that targets direct investment centered around mineral extraction, Buch, Kleinert, Lipponer, and Toubal (2004) found that differences in factor endowments spurred German FDI in post-Communist Europe. While it is not a perfect measure, total resource rents are used as a proxy. Resource rents are essentially profits from resources (revenues above the cost of extracting said resource) and higher values mean higher capital stocks and resource endowments.

These following two variables would have been incorporated into the analysis if widely available and complete data had been found.

Taxes

Higher corporate taxation would theoretically lead to lower investment as profits are reduced. Including taxes as a variable can also provide insights into taxation policies and how they affect investment. The highest marginal corporate tax rate can be used as the measure of this variable but there was only data from a few Sub-Saharan African countries on this measure.

Labor Costs

Due to the hypothesis that German FDI in Africa is largely horizontal (seeking greater market size) than vertical (attempting to minimize costs), labor costs will only be expected to be weakly positive. The limitation is that there are scant measures in the countries being studied. The International Labor Organization, a UN agency, collects data on annual wages in countries but lacks data for Sub-Saharan Africa in the time period specified.

FDI	Average of FDI Flows		OECD
MARKET	Market Size (GDP)	+	World Bank African Development Indicators
INFLATION	Inflation	-	World Bank African Development Indicators
GROWTH	Growth Rate	+	World Bank African Development Indicators
EXCHANGE	Exchange Rate	-	World Bank African Development Indicators
OPEN	Openness	+	World Bank Development Indicators
RISK	Political Risk	+	World Bank Governance Indicators
RESOURCE	Natural Resource Endowments	+	World Bank Databank
COLONY	Dummy Variable if Former German Colony or Not	+	Historical Classification

The estimated equation, again, is as follows:

$$FDI = \beta_0 + \beta_1 MARKET - \beta_2 INF - \beta_3 EXCH + \beta_4 OPEN + \beta_5 RISK + \beta_6 RESOURCE + \beta_7 COL \text{ (1)}$$

The data comes from the OECD Stat database and the World Bank Databank. The sample size is 48; excluding North Africans as the focus is on Sub-Saharan Africa. 4 countries lacked data (Somalia is understandable due to the continuing conflict and lack of a central government) and the regression excludes South Sudan due to it only being founded as a country in 2011. This was cross-sectional data and variations over time were not examined. The data for each independent variable is averaged from the years 2006 to 2010 and a five-year period is chosen as standard.

12. Results

The data set is also small with only 44 countries; meaning that regression results could vary dramatically with minor differences in model specification. However, this is an accepted limitation in this case as this study attempts to look at the Sub-Saharan African context.

German FDI was not conducted in large quantities from 2006 to 2010. The values for the vast majority of countries are close to 0. The raw data demonstrates that German FDI into Africa from 2006 to 2010 was low for most countries. The outliers were South Africa and Mauritius. South Africa's strong economic relationship with Germany has already been documented. Mauritius has strong governance indicators along with a strong financial sector; demonstrating why it had high FDI inflows. South Africa is the most notable outlier with an FDI inflow average of 371.6 million euros between 2006 and 2010. Its inclusion skewed results significantly. The model is tested without South Africa and achieves superior results.

Scatterplot Before and After Removal of South Africa Data Point
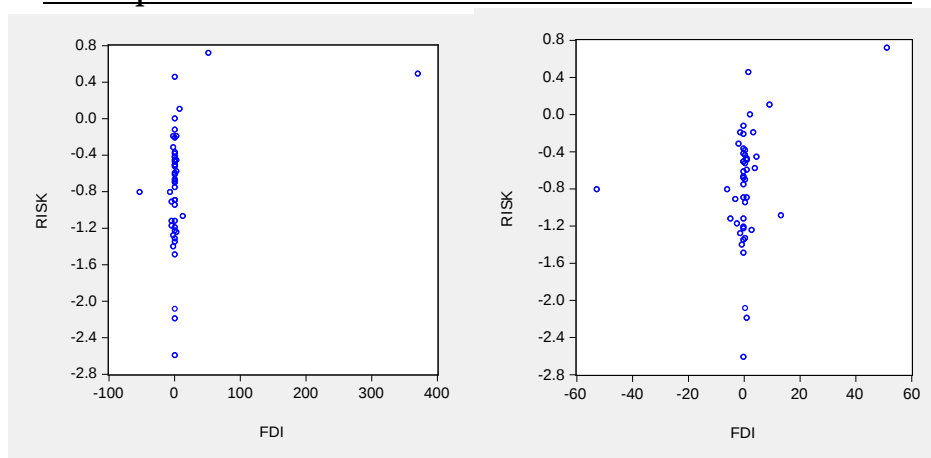
Table of Regression Output

Dependent Variable: FDI
Method: Least Squares
Date: 04/09/18   Time: 11:34
Sample: 1 47
Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.492648	4.725688	0.739077	0.4649
COLONY	0.308548	4.405376	0.070039	0.9446
EXCHANGE	-0.000327	0.000578	-0.565384	0.5755
GROWTH	1.214902	0.658482	1.845003	0.0738
INFLATION	0.001303	0.000831	1.566953	0.1264
MARKET	-2.61E-10	5.04E-11	-5.188980	0.0000
OPEN	2.584104	4.756956	0.543226	0.5905
RESOURCE	0.091732	0.124681	0.735734	0.4669
RISK	8.674351	3.323352	2.610121	0.0134

R-squared	0.548170	Mean dependent var		0.739535
Adjusted R-squared	0.441857	S.D. dependent var		11.72515
S.E. of regression	8.759734	Akaike info criterion		7.361973
Sum squared resid	2608.920	Schwarz criterion		7.730596
Log likelihood	-149.2824	Hannan-Quinn criter.		7.497910
F-statistic	5.156200	Durbin-Watson stat		2.251554
Prob(F-statistic)	0.000294			

The p-value of the F-statistic is < the alpha threshold value of 0.05; therefore, the null hypothesis that the regression coefficients equal 0 is rejected. Therefore, the overall regression is significant and these variables have effects on the dependent variable. Risk is significant with a t-value > 2.5 and a probability < 0.05. This holds with the theory that suggests the importance of alleviating investment risk is key to increasing investment. The regression is also run with a log on Market to compensate for the large values of that variable. This result finds that Risk is still a significant variable. This suggests that German firms considered regulatory quality as a measurement of political risk to be an important factor in making investment decisions.

Estimation issues such as multicollinearity and autocorrelation are a concern and are accounted for. The VIFs are below 10, meaning that multicollinearity was not likely to be present. The Durbin-Watson statistic of 2.2 is close enough to the benchmark of 2; therefore, serial autocorrelation is not present in the data; as expected.

13. Policy Recommendations

In light of these results, a rough picture of German FDI in Africa can be drawn. It must be cautioned that this is not an attempt to prove causality. It seems that firms are reluctant to invest due to political risk captured by the regulatory quality variable. In order for Sub-Saharan African governments to improve their investment attractiveness, institutions need to be strengthened. For example, giving foreign firms the right to defend themselves in an international court against expropriation of assets could lower risk concerns. The Marshallplan talks about increasing African political stability and German government can share best practices in institutional design.

There are measure that the German government can take to ensure the plan's success. Investment guarantees have the potential to alleviate political risk, a major concern for

German firms engaging in FDI as shown by the data. German SMEs, who are especially vulnerable to political risk, are an important part of the development strategy. An efficient way to streamline the development agenda would be to bring the various ministries and organizations under one roof. They can focus on their individual competences but would be coordinated by an overarching commission set up by the federal government.

On the African government side, they must stand firm on technology transfer requirements and tax requirements. Introducing technology transfer regulations for any joint ventures with Sub-Saharan African firms can hasten the process of technological spillover. There are natural fears that this could dissuade investment but if African countries as a bloc, say through the African Union, could introduce comprehensive regulations mandating tech transfer, the greater bargaining power would lead to greater potential success. As noted in the literature review; the greater spillover effects occur the closer countries are in technology level. Therefore, efforts must be made to build up technology levels in Sub-Saharan Africa so that firms can benefit from future positive spillovers. Taxation on foreign enterprise profits is a mechanism by which African governments can boost their public finances and ensure that foreign enterprises contribute to the host economy aside from spillover effects.

14. Conclusion

The German approach to foreign intervention and development has moderated over the past century. The Marshallplan attempts to reflect the key values of inclusivity and empowerment of local communities that development thought has gradually moved towards accepting. Private sector companies from wealthy nations can share their knowledge in order to boost local economies in low and middle-income countries. Understanding these firms' profit incentives is crucial in order to ensure that their activities can maximize social gains. However, there are few clear solutions in development economics and FDI is not a complete panacea for issues such as ill health, structural unemployment, and autocratic regimes. Care must also be taken in order to make sure that corporate power is subject to checks and this can be done by appropriate regulation in both host and target countries.

Future research can extend the analysis to multiple years and construct a panel data set. Much of the data used has been through proxies and estimations. The econometric work in this paper can be seen as exploratory; especially considering the relative lack of studies examining the topic of German FDI in Sub-Saharan Africa. It is hoped that the paucity of research is rectified as German interest in investment in Africa grows. Further data on taxes and labor costs in Africa could build a more complete model and could also help determine if German FDI in Africa is of a more horizontal or vertical nature. German FDI was lacking in Africa from 2006 to 2010 and does not display a clear development strategy. It will be instructive to see if FDI outflows change measurably as a result of the government's re-emphasized Africa policy. In the meantime, improving regulatory quality looks to be a prudent strategy for Sub-Saharan African governments looking to attract German investment.

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Appendix

Map of Average of FDI Inflows into Sub-Saharan Africa from Germany 2006-2010

Average of FDI Inflows from Germany 2006-2010

- Over €100 million
- Over €50 million
- Over €10 million
- Between €1 to €10 million
- €0
- Between -€1 to -€10 million

Data from OECD Stat Database

The Dramatic Decline of American Productivity and the Future Standard of Living

Raphael Potter

This paper examines the recent decline in economic productivity observed in the U.S. economy. The American economy has witnessed sustained high levels of growth for nearly 150 years, but that number has sharply declined in recent years. This paper explores four theories formulated to explain this trend.

The United States of America has been a central player in the global economy for over a century. During that time, American citizens have seen massive improvements in certain metrics that are often thought of as indicative of a country's standard of living. However, since 2008, American productivity growth has fallen dramatically (Pfeiffer, 2016). Given the correlation between productivity growth and the standard of living, this trend should not be taken lightly. This phenomenon becomes even more complicated considering the many technological breakthroughs immediately prior to, and following, the 2008 recession. Economists have attempted to explain this confusing trend in a myriad of ways. Some have argued that the current methods of computing productivity growth are insufficient (Feldstein 2015). Others have argued that U.S. productivity is merely still recovering from the effects of the 2008 recession and that productivity will return to its pre-crisis levels soon enough (Sherman 2017). However, a theory attributed to Robert Gordon, an American economist at Northwestern University, is currently in the spotlight. Professor Gordon argues that the technological accomplishments made between the 1850s and the early 2000s were so monumental that our current achievements are essentially irrelevant. Furthermore, Professor Gordon identifies a variety of characteristics of the U.S. economy and argues that these characteristics are imperative in understanding the productivity slowdown (Gordon 2013). According to Professor Gordon, the combination of the characteristics of the U.S. economy and the low probability of achieving prior levels of technological growth, when taken together, ultimately show that the growth rates experienced between 1850-2000 were an anomaly. Therefore, we should expect the growth rate to return that experienced during the millennia prior to the industrial revolution (Phillips 2016).

It's no secret that the American economy, and consequently other metrics of the standard of living, have witnessed sustained growth over the last 150 years. U.S. GDP has grown from $9,573 per capita in 1950 to over $52,000 per capita in 2016-- a five-fold increase in under 70 years (https://countryeconomy.com/gdp 2018). To put this in context, the entire world's GDP grew by 6.5 times between the Gregorian years 0 and 1870 (https://ourworldindata.org/economic-growth 2018). Concurrently, in the U.S., many other indicators of a high standard of living increased as well. At the beginning of the 20th century, the infant mortality rate in the U.S. was 10%; that number is currently less than one percent (https://www.cia.gov/library/publications/the-world-factbook/rankorder/2091rank.html 2018). The average life expectancy in America is now 78 years, more than double what it was in England at the beginning of the 19th century

(https://ourworldindata.org/life-expectancy 2018). The point is that, regarding certain metrics, the exponential levels of economic growth that the United States has experienced over the last 100 years are phenomenal relative to all human history and have also allowed tremendous strides in other aspects of human life.
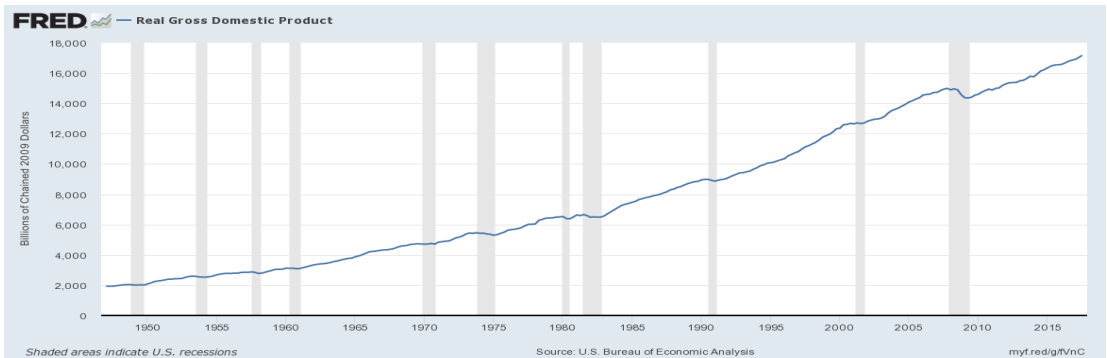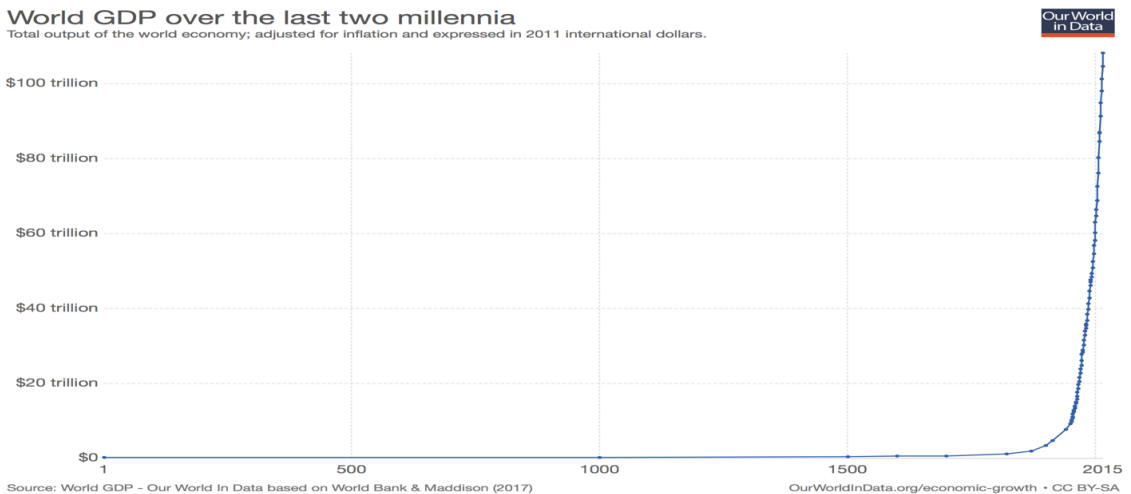

Figure 1: U.S. Real GDP; https://fred.stlouisfed.org/series/GDPC1

Figure 1: Global Real GDP Growth; https://ourworldindata.org/economic-growth

Many economists attribute the productivity growth rate to these stunning improvements. Between 1950 and 2004, U.S. labor productivity grew at a rate of 2.55% per year, and between 2004 and 2010 it grew at 2.0% per year (Amadeo 2018). Yet, between 2010 and 2016, productivity grew at a meager 0.5% per year (Bahar 2017). As frightening as that may be, it is not a localized issue. The U.K. labor productivity growth rate is estimated to have been negative in 2017, meaning that the labor may have been less efficient in 2017 than 2016. To reiterate the importance of this one statistic, it is generally accepted among economists that productivity is a key determinant of living standards. To quote the Federal

Reserve Bank of St. Louis, "labor productivity growth amounts to the average growth of how much goods and services each individual can consume and, thus, is the driving force behind increases in the standard of living." (Morris 2017) This recent decline may seem very puzzling given the rise in new technologies that the world has experienced in the last twenty years. AI, self-driving cars, drones, smartphones, Google, and an endless number of other innovations have been created in recent years. Indeed, this seemingly contradictory trend in which current technological advancements have yet to translate to economic growth is a widely studied phenomenon and has been labeled "the productivity puzzle" by contemporary economists.
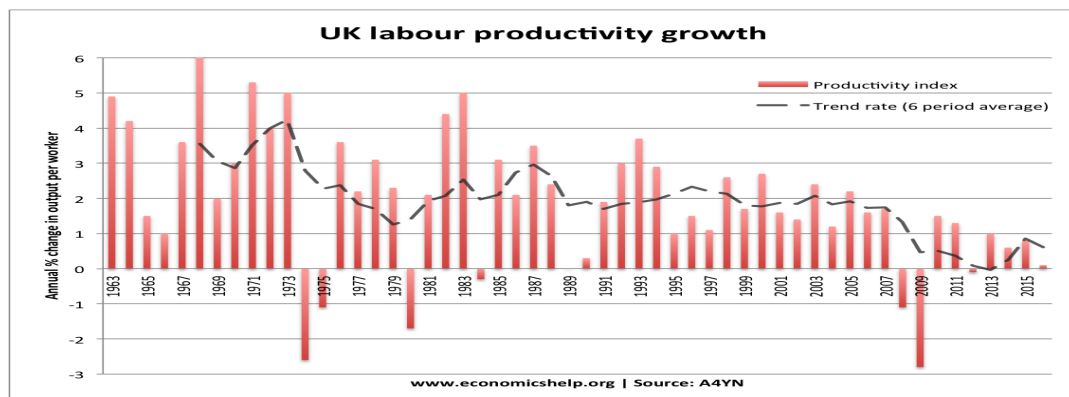

Figure 2: U.K. Labor Productivity Growth; https://www.economicshelp.org/

Many economists and academics have attempted to explain this puzzle, and as would be expected when trying to analyze a highly complicated, global macroeconomic trend, there is no consensus amongst the experts. Yet, some theories are increasingly gaining traction and have been touted as more plausible explanations.

The first and most benign explanation of "the productivity puzzle" is that attempts to quantify the true value of recent economic breakthroughs have been unsuccessful; it follows that the issue at hand is merely one of miscalculation, and that the economy is in better condition than is being reported. To quote Harvard economist Martin Feldstein, "Today's pessimists about the economy's rate of growth are wrong because the official statistics understate the growth of real GDP, of productivity, and of real household incomes." (Perry 2015) This explanation for the "productivity puzzle" is compelling at face value. The tools for measuring growth that have been used in making productivity calculations are the same ones that were used 100 years ago - surely this system is unable to properly account for our modern breakthroughs. How would the value of free services like Facebook or Google be measured in terms of productivity?

Nonetheless, other economists are not sold on this explanation. Their qualm with this analysis is primarily rooted in that, as they see it, the numbers don't add up. One of these dissenting economists, George Mason University economist Tyler Cowen, points out the following: the conservative estimates for the losses due to the productivity slowdown since 2004 are a whopping $2.7 trillion (Cowen 2015). To compensate for this disparity,

consumer surplus from these technologies would have to be five times higher than what they are currently measured at- quite a large gap for a "miscalculation." Furthermore, according to Professor Cowen and others in his camp, the values of these "free" services (like Facebook) do appear in GDP numbers, just not directly. To use Facebook, for example, one generally needs an internet connection, a smartphone, or a laptop - all of which appear in the current calculations.
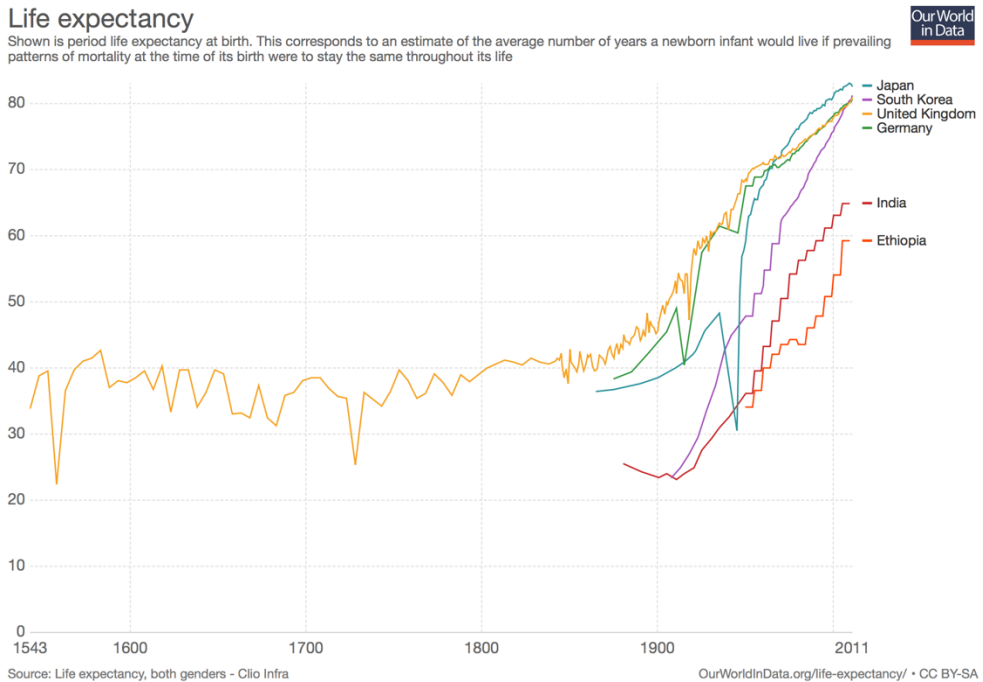

Figure 3: The Growth in Life Expectancy; https://ourworldindata.org/life-expectancy

An alternate explanation for the "productivity puzzle" is one of historical context. Even though 9 years have passed since the recession of 2008, some argue that we are still collectively reeling from its effects (Madigan 2015). Following the recession, there was a slowdown in capital investment - a problem that 94% of economists in a Wall Street Journal survey agreed was having a "large" or "modest" impact on productivity (Feldstein 2015). Additionally, others posit that like any other technological revolution, time is required before the effects of innovations clearly manifest themselves. There is typically a period between the introduction of new technologies and their widespread adoption (Gordon 2016), and it is possible that we are currently in that buffer zone, which has arguably been elongated by the recession.
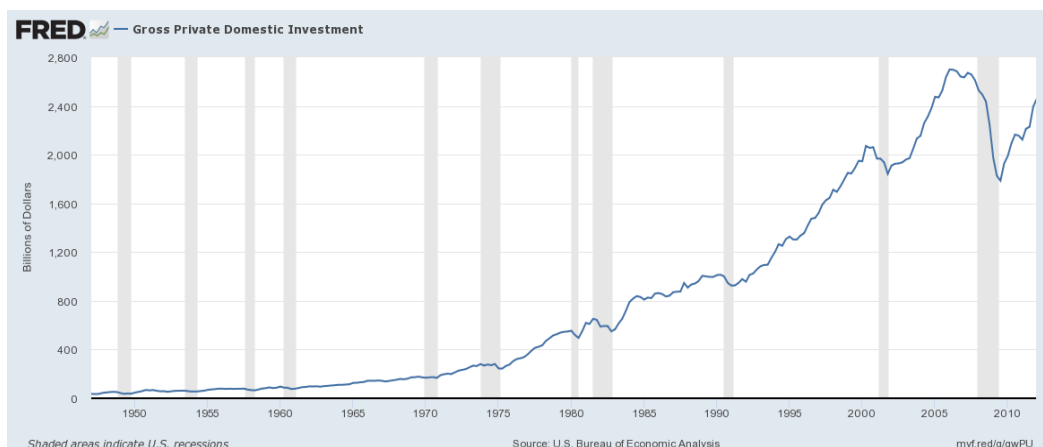
Figure 4: Growth in U.S. Private Domestic Investment;
https://fred.stlouisfed.org/series/GPDI

Another explanation of "the productivity puzzle," one that is something of a synergy between the two previous theories, is that of "pack leaders" and "zombie firms". A study done by Harvard Business School has shown that the gap between the top 10% of firms and the bottom 10% of firms, productivity-wise, has increased by 14% between 2001 and 2012 (Berlingieri 2017). Essentially, the claim is that the higher-productivity firms have been adopting and integrating new technologies, while less productive and less wealthy firms have been struggling to do so (Criscuolo 2015). An explanation of this phenomenon given by economists is that, due to their relatively higher baseline efficiency and higher levels of capital, higher-productivity firms have a strong competitive advantage and are therefore more easily able to make the necessary adjustments to continue increasing their productivity. Additionally, proponents of this theory point out that low interest rates and massive government bailouts have allowed "zombie firms" to continue dragging down the pack by granting them easy capital that has slowed the process of eliminating them from the market. An OECD report released in January 2017 concluded that, "a 3.5% rise in the share of zombie firms—roughly equivalent to that observed between 2005 and 2013 on average across the nine OECD countries in the sample—is associated with a 1.2% decline in the level of labour productivity across industries." (McGowan 2017)
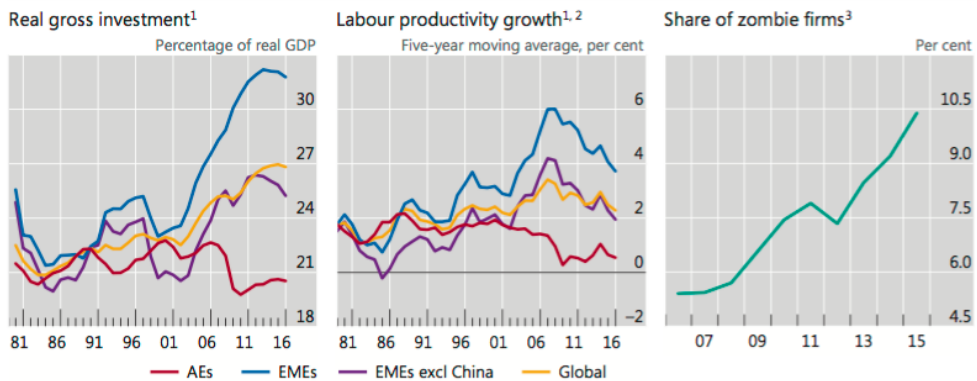
Figure 5: Growth of Zombie Firms; https://www.bis.org/publ/qtrpdf/r_qt1709.pdf

The final and most frightening explanation for the "productivity puzzle" is the theory of noteworthy economist Robert Gordon. In his book, *The Rise and Fall of American Growth,* Gordon argues that we have run out of good ideas. Gordon's essential claim is that the three industrial revolutions and all the inventions that came with them are largely insurmountable; whatever "breakthroughs" we think we are on the cusp of achieving are puny in comparison to what has already been achieved. To begin with, Professor Gordon lays out four "headwinds" hitting the U.S. economy that, even if innovation was to accelerate to its long-gone peak, would still cut growth in half (Gordon 2013).

US productivity growth is at its lowest level since the 1800s

Labour productivity growth, annual percentage change in GDP per hour worked

*Simple average of France, Germany, Italy, Spain, Sweden, UK
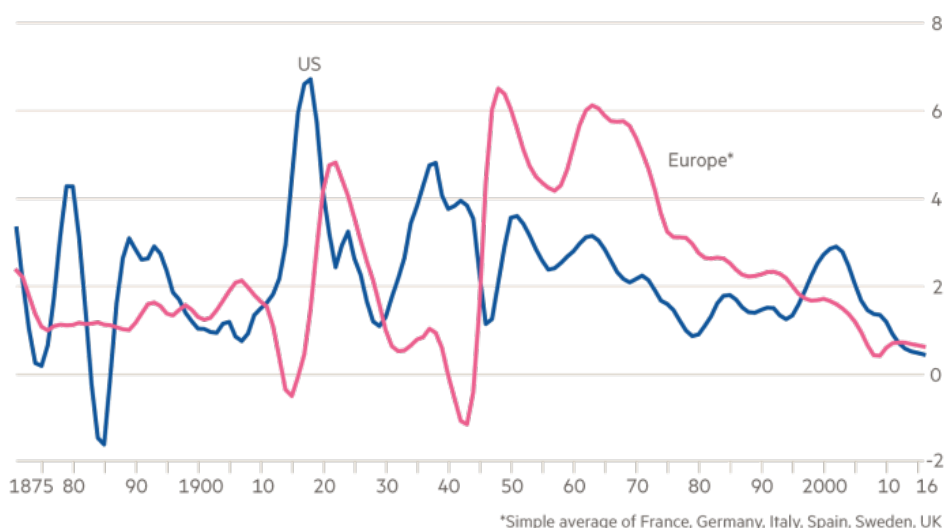
Source: Bergeaud, Cette & Lecat, "Productivity trends in advanced countries between 1890 and 2012," Review of Income and Wealth, 2016; McKinsey Global Institute

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Figure 6: U.S. Productivity Growth; https://www.ft.com/content/76057bd8-1342-11e8-940e-08320fc2a277

The first of these "headwinds" is demographics. Professor Gordon argues that one of the most significant factors in the growth of U.S. productivity in the 20th century was the introduction of women into the labor force. In contrast, today we face an increase in retirement by baby-boomers, while prime-aged males of low educational achievement are dropping out of the labor force at a high and increasing rate. These two population dropouts have, and will continue, to significantly decrease the size of the U.S. labor force.

Second, Gordon points out the failures of the U.S. education system. The average cost inflation of higher education is 3.6% per year, and the U.S. currently holds one trillion dollars of college debt. Furthermore, the U.S. college graduation rate is 15% lower than that of its neighbor Canada.

The third headwind identified is the amount of debt in the U.S. Professor Gordon attributes much of the U.S. economic growth in the early 21st century to consumers taking out large amounts of debt - something they are only paying back now, in the place of spending. In addition to private debt, the collective U.S. debt is staggering - the national debt is over $20,000,000,000,000. The last of Gordon's "headwinds" is income inequality. Prior to the financial crisis, the economic growth of the bottom 99% of earners was half a point lower than that of the top 1%. (Gordon 2012)

After accounting for the "headwinds," the 2.0% growth rate experienced between 1891-2007 becomes a mere 0.8%. Yet, even that 0.8% is the best-case scenario, one that assumes that our innovations are as important as those of the 1891-2007 era. It might be tempting to believe that given recent advances in biotech, AI, and other technologies, we can match those innovations. However, careful consideration must be given to what was

actually accomplished between 1891-2007. Electricity, planes, cars, elevators, electric tools, computers, cell phones, electric washing machines, central heating, the central combustion engine, underground water pipes, underground sewer pipes; these inventions were all created in that time frame. To properly stress this point, Professor Gordon challenges his audience during presentations by showing them a slide with a toilet and an iPhone next to one another and asking what people would rather lose. Ultimately, Professor Gordon argues that the growth experienced between the 1800's and the 2000's was an anomaly, a tiny blip in human history, and that we are on pace to return to pre-industrial revolution growth rates of around 0.2%. (Gordon 2012)
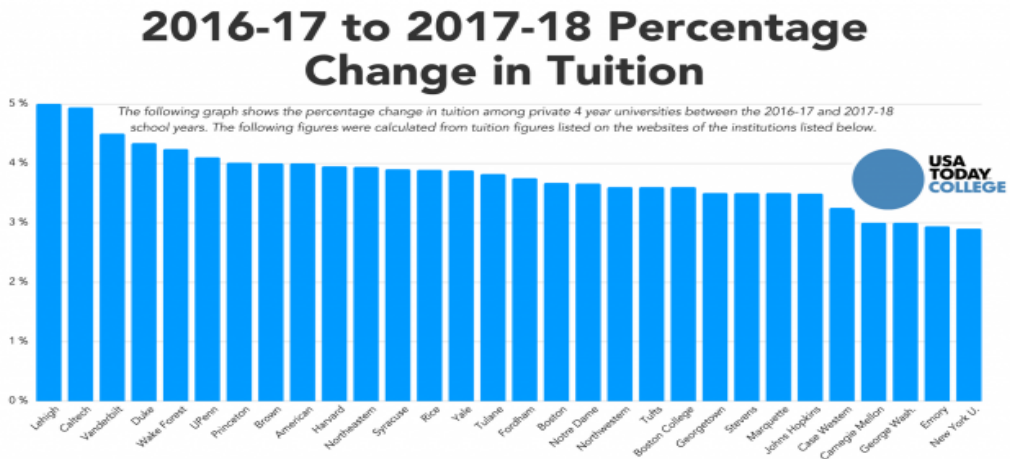

Figure 7: Inflation of College Tuition; http://college.usatoday.com/2017/06/09/private-college-tuition-is-rising-faster-than-inflation-again/

While there is no definitive explanation as to what is causing our current decline in productivity, each theory outlined here has some merit. Additionally, for each of the negative explanations outlined in this article for the "productivity puzzle," pragmatic solutions exist that may be helpful to our ailing economy. The beauty of economics is that it is, unlike "harder" sciences, the study of certain aspects of human behavior, and human behavior is malleable. For the sake of our generation and generations to come, hopefully human ingenuity will provide us with the necessary tools to continue our march towards a better global future, beginning with productivity.

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Fame as a Commodity: The Transfer of Social Capital on Instagram

Amélie Matisse

This paper describes the ways in which fame is transferred from one person to another on social media, specifically in terms of celebrities' romantic relationships with non-celebrities or less well-known celebrities. This topic is engaged by considering the history of the attention economy as well as the history of the transfer of fame and whether this phenomenon existed prior to the birth of social media networks. Two different celebrity relationships are analyzed to portray how fame can be transferred during their relationship and after their breakup. Investigating these relationships demonstrates how some proponents in social media are able to profit from a relationship in terms of fame and social capital, while others fail to grab the attention economy.

1. Introduction

Celebrity can be identified as a performative practice, rather than a title given to an individual. Certain attributes of this practice include the maintenance of a fan base; performed intimacy, authenticity, and access; and the construction of a consumable persona. With the digital age comes the introduction of the "micro-celebrity," which involves online practices such as one viewing their audience as a fanbase or one curating their self-presentation in order to construct a consumable persona whose popularity is maintained through fan, or audience, engagement (Marwick, Boyd 2011, p.139-40). Along with the creation of the phenomenon of the transfer of fame through social media networks, the digital age has ushered in an entirely new form of economy found in the attention economy. The attention economy treats human attention and fame as a commodity (Goldhaber, 1997). Fame is considered to be a commodity in that it is a form of capital that is transferred between individuals participating in the attention economy.

The guiding theme that has directed my research analyzes how fame as a commodity is transferred from one person to another by way of social media, specifically Instagram, and the way in which this transfer of fame reflects elements of the developing attention economy. Through my research I have found that those who are able to perform celebrity successfully are those who maintain the attention economy, while those who do not fully perform all the elements of celebrity cannot maintain this exchange of capital. To further understand this interplay, I will examine the development of the attention economy through an early example of celebrity as previously defined.

2. History of the Attention Economy

The introduction of social media and the Internet has affected the way in which we define an economy. Furthermore, we have undergone a transition in the way in which we define a commodity. Material commodities produced with an economy's factors of production have taken a new form in the digital age with immaterial labor through information distributed online. A feature of this form of economy is its democratic nature;

anyone with access to the Internet and social media can participate. Social media participants all perform affective labor online through likes, comments, or by sharing information with others. The attention economy treats attention as a scarce commodity, and, by extension, fame has become a form of capital fed by this commodity. Attention is traditionally defined as taking notice of something. This definition withstands in this paper in referring to the attention economy, though it is now quantifiable using the visible data on social media, such as likes and comments. The self is curated online to gain attention, leading to the performative practice of the celebrity (Goldhaber, 1997). This concept of the self has become a product which is formed through the immaterial labor in the attention economy. While attention itself is an immaterial commodity, it additionally provides access to material commodities, such as brand deals or business ventures, which can be seen in both its past and more recent history.

3. History of the Phenomenon of the Transfer of Fame

The cult of personality is traced back to Romanticism in the 18th century. This is the point at which individuals began to utilize media or propaganda to create an idealized, larger-than-life version of themselves through specific self-branding (Heller, 2004). Industries recognized the capital that individuals could achieve through the performance of celebrity. This is demonstrated through the film industry's withholding of the names of actors in early 20th century films. This was done as film producers feared an obligatory increase in actors' salary if their personal image was heightened and considered to be a brand by culture (McDonald, 2000).

Celebrity culture began in the late 19th and early 20th centuries when film industries could no longer directly control the publicity that actors received. With the rise of celebrity culture came the inevitable rise of public interest in celebrity relationships. Elizabeth Taylor's marriages are an early example of public fascination with celebrity relationships. In August of 1949, Taylor appeared on the cover of *TIME* magazine discussing her relationship with her then-fiancé Bill Pawley ("Elizabeth Taylor: Star Rising," 2017). Pawley was a vice president of a Floridian bus line and amassed much fame from his relationship with Taylor, which he capitalized by selling their love letters in 2011. The evidence of Pawley's continuous fame from his relationship with Taylor is demonstrated by the numerous tabloid articles written about his death in 2012, one of which is featured in a 2012 article from the *Daily Mail*.

The culture of celebrity and the transfer of fame have evolved with the digital age, simplifying the transfer process through immaterial labor, such as a tag on Instagram. In order to solidify the allocation of fame, two different celebrity relationships will be examined in which fame was transferred in a different way from one individual to another. The ways in which celebrity takes place in the attention economy is by utilizing celebrity performance and social identity as well as how each characterizes the attention economy and social media.

4. Sonia Ben Ammar & Brooklyn Beckham

In mid-2015, Sonia Ben Ammar was initially known as the daughter of a movie producer and a voice actress for animated television shows, until she entered an intimate relationship with Brooklyn Beckham, the son of David and Victoria Beckham. Sonia Ben Ammar's and Brooklyn Beckham's relationship became public after Beckham posted an Instagram picture of Ben Ammar on top of the Arc de Triomphe on September 7, 2015 (Appendix A). The first tabloid article about their relationship appeared in the *Sun* on September 9, 2015, confirming that that they were in an intimate relationship (Fahey, 2012). Ben Ammar only has 30 Instagram photographs posted on her account's page prior to her fame; her Instagram account has been private up until hers' and Beckham's relationship went public. Many of the posts she made prior to the announcement of their relationship has been deleted. Ben Ammar had approximately 1,000 followers before she acquired fame. Her first Instagram posts after fame were a balance between non-professional photographs of herself (i.e. shot on an iPhone) and photographs of herself with her friends from high school and her family.

Ben Ammar was signed by Next Models in September, and by November posted almost exclusively pictures of herself, both amateur and professional. The rising model began to travel from Paris, her main place of residence, to Los Angeles for modeling jobs. In earlier photographs posted immediately post-fame, she is often smiling or making a funny face. However, a couple of months post-fame, she exclusively posts pictures with the "smize," meaning smiling with one's eyes—a term coined by Tyra Banks to describe a straight-faced pose with intense eye contact with the camera. This facial expression is a strategy of attracting attention that is preferred by many of the "Instagram celebrities" that Ben Ammar began to associate herself (Appendix B). Her account reached 100,000 followers on January 13, 2016, and she then began posting photographs of herself featuring people with a higher level of fame, such as Gabriel Day Lewis, Rihanna, and Selena Gomez. She then focused on associating herself with social media influencers that transitioned to Instagram models, such as Amanda Steele, Meredith Mickelson, and Suede Brooks. There was a noticeable decline in the quality of Ben Ammar's posts a year after her relationship became public. Her posts were low-quality, with captions—or a text that complements photographs posted on social media platforms—attempting at relatable humor. However, these posts and captions were not well received by her audience, as evidenced by the corresponding decline in likes: from tens of thousands to a couple thousand (Appendix C).

At this point, Ben Ammar believed that she had achieved a level of fame that gave her the ability to post any type of content and expect a constant stream of social capital, which in this example is seen in the number of likes received. The decline in likes, however, was clearly noticed by Ben Ammar, as these posts were followed with more sexually charged photographs as well as photographs from runways during various Fashion Weeks. Sexually charged photographs are employed on social media to provoke one's audience, and can be met with audience support relating to body positivity, or criticism based on this traditionally un-feminine portrayal. In both cases, one will gain attention, and whether it be good or bad attention, it still equates to social capital. Ben Ammar's most recent posts are mostly of a higher quality and edited professionally, featuring only other users who are

verified as Instagram models. She has deleted a majority of photographs with any non-verified users, with the exception of her closest friends from high school. She occasionally posts iPhone quality pictures in areas such as supermarkets to maintain relatability to her audience, an important factor in social capital retention. Ben Ammar is now verified on Instagram with 342,000 followers.

Beckham only posted one photograph of Ben Ammar during their relationship; his post showed Ben Ammar looking away from the camera and did not tag her. This was likely done at her request, as she perhaps did not intend to become famous from their relationship. Beckham, however, publicly displayed his affection without mentioning Ben Ammar by name, posting a photograph of a romantic message written in neon-sign style— an effect which Ben Ammar frequently used in her photographs (Appendix D). They also posted the same photograph of street art in Paris at the beginning of their relationship, which allowed their audience to know that they were together (Appendix E).

Ben Ammar's still-growing fame is achieved through successful performance of celebrity; she maintains a fan base by interacting with her followers in captions and comments as well as by posting photographs similar to Beckham's in order to perform intimacy and show their connection. She performs authenticity and access by frequently posting photographs of herself wearing casual clothing and minimal makeup, giving the illusion of intimacy with her followers. Her persona is consumable and she has gained social capital even since hers' and Beckham's mid-2016 breakup, as she is relatable to her audience. Yet, her brand is seemingly unattainable for the non-famous individual.

5. Kim Kardashian & Ray J

In 2007, Kim Kardashian was publicly known as Paris Hilton's assistant and companion until a sex tape between her and rapper Ray J was released. Following this, Kardashian's mother, Kris Jenner, pitched a reality show about her family to TV producer Ryan Seacrest. The first few episodes of *Keeping up with the Kardashians* address the release of Kim's sex tape as well as the family's superficial affairs involving expensive material possessions and their arguments over what many would perceive to be trivial matters. By 2009, the ratings of the show were falling, that is until Kourtney Kardashian had her first child. This was the first time that the Kardashians began making headlines outside of their television show and began to utilize social media to gain social capital.

In 2012, the year that Kim Kardashian joined Instagram, she became the application's most popular account. She initially posted many lower quality photographs of herself, though her account has evolved to include more professional photographs as well as more sexualized photographs, which she is infamously known for. She additionally showed off her wealth extensively up until she was robbed at gunpoint in Paris in September 2016. Kardashian went on a three-month Instagram hiatus after this event. When she returned to the application her posts were of lower quality, either taken on analog cameras or filtered to look like analog camera photographs. Post-hiatus, Kardashian's Instagram account became significantly more family-centered with the first posts after her hiatus being family portraits in a cabin, which she received criticism for since

the photographs were seen as an attempt to emulate a middle-class lifestyle. As of May 2017, this analog photograph and family theme has been maintained over the past few months with occasional professional photographs of herself (Appendix F). Kardashian created a persona that was relatable enough to consumers, though still so grandiose that she gained admiration and social capital. She has become a sex icon by exploiting the attention economy in a way in which Ray J could not, which effectively crowded out and diminished his popularity. Though Kardashian initially gained famed because of her sex tape with Ray J, her following grew exponentially while Ray J descended into irrelevance.

Kardashian performs celebrity through engaging with her audience by speaking directly to them in her captions and replying to her fans through comments. She performs intimacy by posting photographs with her family; displays authenticity and access by posting exclusive photographs not available on another platform; and creates a consumable persona by achieving a level of relatability with her audience, yet still maintains an attractive, larger-than-life personality. Ray J does not perform celebrity in the same way; he almost exclusively posts photographs of himself or material objects to show off his wealth, which obtain a few thousand likes at most (Appendix F), in contrast with Kardashian's millions of likes per photograph. He has displayed bitterness over Kardashian's fame, which can be recognized in his 2013 single titled "I Hit It First," an act that reaffirms her achievement of social capital.

6. Conclusion

Those who gain social capital and participate in the online attention economy are able to do so as they can perform celebrity to reach a high level of fame. Sonia Ben Ammar and Kim Kardashian have created online selves that cultivate attention and social capital, as they utilize specific strategies to gain and retain their audience in the form of an all-encompassing performance of celebrity. One can easily gain fame and social capital by being associated with someone who already possesses it, though the maintenance of the attention economy entirely depends on how well one can perform celebrity. This is significant as the majority of our current society has a presence on social media, and those who are on social media are attempting to gain attention and social capital, a process that will continue with the further expansion of the digital age. The economy as we know it has evolved and will continue to develop as well. Fame and social capital have become commodities, and, at this point in time, there are practically more attention transactions than monetary transactions occurring on a daily basis. Understanding the attention economy by looking at who gains social capital and who does not, as well as who can maintain this capital and who cannot, will allow us to better understand the future of our ever-changing economy.

Appendix available at http://theeconreview.com

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