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Letter from the Editor

Dear Reader,

Just as we celebrated the beginning of a new decade as we rang in the new year, we are thrilled to be celebrating a decade of Equilibrium: The Undergraduate Journal of Economics. Over the past ten years, our organization has showcased the talents of student researchers, writers, and editors, and provided a unique opportunity for students to strengthen their ability to apply economic concepts to societal issues. Welcome, Reader, to the tenth volume of Equilibrium.

This journal is an accomplishment written entirely by my undergraduate economics peers. In the following pages, you will find a variety of challenging economic topics ranging from the effects of coral reef damage to vulnerabilities in the U.S. and China trade war. Working alongside this year's group of staff and contributors has been an honor and I am incredibly impressed with the work that has been created. I am confident that you will be left with a similar feeling as you continue through the pages of this journal.

Publishing Equilibrium is a combined effort and there are so many important people to thank for helping make volume ten possible. This year has been a period of change as we look forward to another successful decade of Equilibrium, and we appreciate the guidance and support of Alicia Johanning and Nick Bourke throughout the process. Additionally, many thanks to Amy Schultz of the Digital Studies program for connecting us with talented designers and for facilitating our partnership with the program. Finally, a very special thank you to the Economics Department faculty members who graciously provided their expertise and guidance to each of our volume ten writers.

As I reflect on my time with this organization and as a student at the University of Wisconsin, I am proud of the exceptional work this team has done and I look forward to seeing what is in store for the journal's future. Thank you for reading volume ten and supporting Equilibrium.

Sincerely,

Catherine Peterson
Editor in Chief

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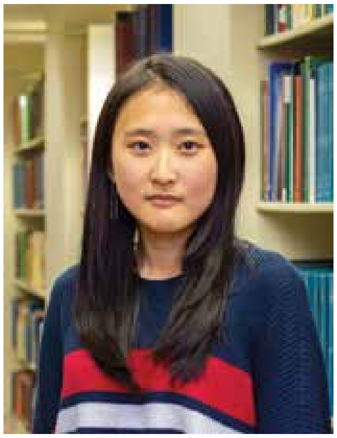
Catherine Peterson
Editor in Chief



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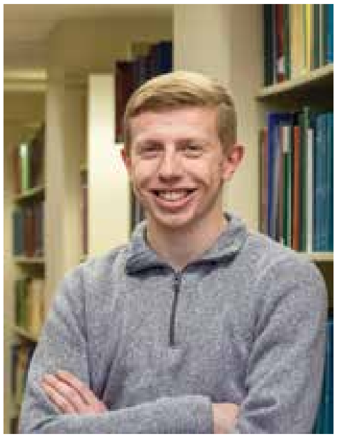

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The Dominant Dollar

Writer Michael Sauer
Researcher Matthew Theobald

Global trade and international economics are deeply interwoven into the fabric of modern commerce. The foundation of this structure rests firmly in the international economic order established by the United States after World War II, and more specifically, in the permanency of the U.S. dollar in trade invoicing and debt denomination.

In his research paper, "Trade Invoicing, Debt Denomination, and the Dollar," former UW undergraduate, Matthew Theobald analyzes the relationship between both the percentage of trade invoiced and debt denominated in U.S. dollars across 16 Western economies. His results produce clear-cut correlative evidence within these countries, a phenomenon that mirrors pre-existing literature in the field. However, the research does not investigate the same association beyond Eurozone and North American economies.

RESEARCH MODEL

To determine the connection between trade invoiced and debt denominated in U.S. dollars, Theobald employs a three-part regression model: the share of debt denominated in dollars affecting the proportion of trade invoiced in U.S. dollars, debt denominated in the British Pound, and inflation variance. The first component strikes at the very crux of the research endeavor. Scrutinizing the relationship between trade invoiced and debt denominated in U.S. dollars can better illuminate fiscal, monetary, and foreign policy influencing trade networks and currency exchange.

Second, accounting for the British Pound gives richer intuition for the composition of nations' portfolios. For instance, beyond holding U.S. dollars and Euros, Eurozone countries conduct economic exchange with the United Kingdom, which retains the British Pound as its operational currency. Neglecting this fact could fatefully distort final results. The final regression, inflation variance, is crucial to correctly standardizing nominal debt and trade figures in common terms. Without this factor, there is little hope for accurate findings. Chronologically, each regression builds successively upon its predecessor by refining the model to more perfectly reflect reality.

RESULTS

Beginning with the first regression, Theobald discovers high statistical significance linking U.S. dollar denominated debt with trade invoiced in U.S. dollars, with a coefficient of 0.826 at the 95 percent confidence interval. Effectively, this high correlation discounts the impression that Eurozone countries would be more inclined to utilize the Euro, their "home currency," in trade outside the Eurozone. Although unintuitive, the model will be sharpened by subsequent extenuating variables.

Next, after incorporating the British Pound into the model, the regression yields a slightly weaker coefficient of 0.76 at the 95 percent confidence interval. Despite being more closely attuned to our perceptual understanding for countries and preference for their home currency, this figure still claims a statistically significant relationship between trade invoiced and debt denominated in U.S. dollars.

Lastly, the third regression integrates inflation variance into its methodology, finding a coefficient of 0.72 at the 95 percent confidence interval. Even at a marginally fainter correlation, the U.S. dollar boasts incredible influence across debt denomination and trade invoiced for Eurozone countries trading beyond the Euro bloc. This conclusion matches the broader findings advanced by economic literature in this field. Ultimately, the home-bias for currency usage in the Eurozone does not hold much influence relative to the U.S. dollar.

LIMITATIONS

A key limitation to this research paper, one which Theobald readily admits, is the lack of international breadth to the analysis conducted. The 16 Western countries examined in the analysis are firmly connected with the United States in the international economic order, for which the U.S. dollar functions as the reserve currency. Historically, this intimacy should come as no surprise. The United States contributed substantially to post-WWII European financial, social, and political renovation by launching targeted relief packages within the continent and institutionalizing global architecture to amplify economic development. Today, these ties remain deep, as evidenced partially by the findings advanced by Theobald.

Further, existing subject matter literature delves extensively into associations between trade, currency, and debt within the European and North American contexts. These countries exhibit strong liberal tendencies and openness in their economies, both of which make them simple subjects for research. By contributing to a field previously well-endowed with established literature, Theobald does not advance a particularly innovative methodology or conclusion beyond preceding research. However, this research paper does serve to corroborate insights developed by the discipline.

Finally, Theobald utilizes two research papers published by Goldberg and Tille during the Great Recession to establish empirical evidence for the U.S. dollar becoming the anchor currency in trade invoicing during the late 20th century. Moreover, these papers are employed to corroborate the Eurozone's irregularity, vis-à-vis other regions in the world, for having a markedly lower share of trade invoiced in U.S. dollars. While this is not an inexcusable offense, these research papers may showcase data, now perhaps outdated, years removed from the Great Recession. The dollar's preeminence before the financial crash is incontrovertible, but its enduring dominance relative to the pre-crash era endures as a question unexplored by the paper. Unveiling the dollar's primacy, and more specifically, the trajectory of its primacy in trade invoicing, debt denomination, and exchange rate volatility, would prove substantial in assessing the evolving composition of international economics and the currencies which make it all flow.

POLICY IMPLICATIONS

The policy implications resulting from this discussion are both many and vital. The U.S. government, the sole proprietor of the U.S. dollar, holds a collection of nationally relevant interests, both domestically and across the globe. Securing these interests, be they safeguarding human rights, preserving energy resources, or deepening bilateral partnerships, necessitate tools of statecraft to achieve leverage and, thereby, national objectives. The U.S. dollar serves as a sophisticated platform to realize these American interests across political, economic, and diplomatic spheres.

Spurred by American disruptions to global trading networks, U.S. allies and rivals alike are seeking to construct alternatives to international commerce away from the U.S. dollar.[1] With hardly any coordination, a slew of currencies are competing to be the centerpiece of globalization. Overawing the dollar's preeminence has proven to be a daunting, and thus far, a wildly unsuccessful endeavor. However, the present reality should not be considered permanent in the slightest – political and economic phenomena are perpetually fluid and evolving. In just a few years, China is poised to launch the digital Renminbi, a competing platform to the U.S. dollar that is fully integrated with blockchain technology, promising to deliver a decisive edge in usability, surveillance, and global dominance.[2] A development such as this would gradually gain traction at first before, potentially, upending the system altogether. There is much yet unknown about a digital currency's functionality, but it could prove to be utterly transformative.

Theobald's research is crucial to understanding the relative power of currencies. His research is in part a diagnostic net assessment about the current currency environment. Such research can be highly insightful when carried over a period of 5-10 years to ascertain the trajectory of currency usage and precise balance of power. Policymakers can apply this knowledge into practical matters of statecraft, namely through sanctions and asset freezing.[3] Moreover, the U.S. can be spurred into action to course correct policy or counter revisionist efforts to displace the dollar. Standing at the peak of global finance and trade affords the dollar a robust advantage vis-à-vis other currencies, and even if delayed in exposure to currency enhancements, it has a positional advantage that permits it to be restored to a dominant state. The U.S. can and should remain vigilant to rapid enhancements in currency.

FUTURE RESEARCH

While the implications for U.S. policymakers in constructing, implementing, and assessing policy objectives designed to advance U.S. strategic interests and strengthen global institutions remain unexplored, there is much to appreciate in trade invoiced and debt denominated in U.S. dollars. Avenues for future research should be both bold and innovative in vision and execution.

First, the United States would do well by pursuing research on trade invoices and debt denomination in U.S. dollars across the global expanse. This would call for research projects, similar to Theobald's in North America and the Eurozone, on Central and South America; West, South, Central, Southeast, and East Asia; Sub-Saharan Africa; and Oceania. Combined, this cross-continental research would yield the completest map of the dollar's dominance. Additionally, it would enable the U.S. to scrutinize geographic zones to gauge if and how the power of the dollar is receding. Understanding this would particularly salient in West Asia and East Asia respectively, as Iran attempts to evade U.S. sanctions and China spawns an entirely new digital currency system.

Second, the United States should investigate methods to secure and strengthen its economic leverage via the U.S. dollar. Conducting research this broadly defined would likely be an arduous task, but the payoff could be enormous and essential to American economic interests. Further, these tools of statecraft used vigilantly, could be a great source of deterrence or punishment against nations engaging in cultural genocide, ethnic cleansing, and other heinous actions as defined by the United Nations.

Third and finally, the United States must consider the possibilities, advantages, and shortcomings of generating a digital currency. The time log of human progress, and certainly adversarial intent, point to digitized currencies potentially revolutionizing international commerce and shared prosperity. To stake a strong claim in this presently unimaginable future, research should be concentrated on optimizing a digital currency to maximize the dollar's grand potential.

1. Scheck, J., & Hope, B. (2019, May 30). The Dollar Underpins American Power: Rivals Are Building Workarounds. Retrieved December 29, 2020, from https://www.wsj.com/articles/the-dollar-powers-american-dominance-rivals-are-building-workarounds-11559155440

2. Elegant, N. X. (2019, November 1). China's Digital Currency Is a 'Wake-Up Call' for the U.S. Retrieved December 16, 2020, from https://fortune.com/2019/11/01/china-digital-currency-libra-wakeup-call-us/

3. Durkin, A. (2019, June 14). U.S. Dollar Provides the Muscle for Economic Sanctions. Retrieved January 3, 2020, from https://tradevistas.org/u-s-dollar-provides-muscle-economic-sanctions/

About the Researcher: Matthew graduated from UW in the spring of 2019 and is currently a first-year Ph.D. student. As an undergraduate, much of his interests and studies focused on international trade and finance. Exploring dollar-denominated debt through his senior thesis inspired research questions on how its results and implications can tie into sovereign debt. He looks forward to addressing these questions and continuing research in these fields throughout his Ph.D. studies in economics along with peripheral interests in international economics and economic history.

Effects of the 2005 Bankrupcy Bill on Personal Filings

Writer Kesong Cao
Researcher Benjamin Rolsma

The word "bankruptcy" is usually associated with large firms. Indeed, famous examples include Lehman Brothers during the 2008 Financial Crisis and Enron in 2001.[1] Both cases mark significant events that led to progress in property law which then transformed the finance industry. Meanwhile, the term "I am broke"[2] has been a real, legal case for many – from 2005 to 2017, about 12.8 million consumer bankruptcy petitions were filed in the federal courts.[3,4]

The history of bankruptcy laws is a struggle of interests between creditors and debtors: when a bankrupt person can just walk away or only pay a part of their debts, financial institutions are likely to be more discreet with loan approvals. The Bankruptcy Act of 1898 was the first nation-wide comprehensive bankruptcy law passed by U.S. Congress. It extended the eligibility to file involuntary bankruptcies from just merchants to all individuals, which had failed in the previous three attempts in 1800, 1841, and 1867.[5]

But wait, what is debt? Debt is one deferred payment or a series of deferred payments that are due in the future, which allows the borrower to use the lending amount (usually to purchase something) immediately.[6] Essentially, the debtor is spending future income. Also, debts come with two types: secured or unsecured. Secured debts require collateral assets that would be seized in case of non-repayment, or insolvency, while unsecured debts do not. For individuals, a common example of unsecured debts is credit cards: because it is unsecured, credit card companies set high interest rates to offset risks. Home and auto mortgages are common examples of secured debts.[7]

For those who cannot repay their debts, Title 11 of the United States Code (a.k.a. the Bankruptcy Code) enables them to get a fresh start by choosing one of the two paths:

1. Chapter 7 bankruptcy: liquidating their assets. The case usually resolves in about three months, and most of their unsecured debts are discharged.
2. Chapter 13 bankruptcy: creating a three to five-year repayment plan. Wealthier debtors often opt for this in order to avoid losing assets.

Data shows that the number of filings per thousand people has been slowly rising since 1965 and peaked at around 5.5 in 2005. To alter an increasing trend of potential abuse of bankruptcy laws, the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) was passed that year. By presuming that all filers are inclined to abuse bankruptcy laws, BAPCPA introduced a "means test"[8] – the calculation of one's monthly and total disposable income – for debtors whose income was above their state household median. Those who fail the means test are therefore "abusive" of bankruptcy laws, and they are only allowed to file for Chapter 13 bankruptcies.

Benjamin Rolsma, an undergraduate Economics major at UW-Madison, wrote a research paper titled "Why Do Consumers File for Bankruptcy Post-BAPCPA?" to study the impacts of BAPCPA on individuals' choices between Chapter 7 and 13 bankruptcies.

The paper addresses two major issues in previous studies on bankruptcy choices: sample representativeness and sample selection bias.

The sample representativeness issue exists, as there isdisagreement on how to characterize debtors. Researchers often use the term "honest but unfortunate debtor" to describe the optimal bankruptcy filer. Under this assumption, Domowitz and Sartain[9] used a sample of 17,565 filings in 1980 in five federal court districts. They used a logistic model, which measures a probability of bankruptcy filings between 0 and 1. Their model found that the top two factors that would increase filings were health expenditure shocks and a high credit card to income ratio, and the top factor that would decrease filings was homeownership. In contrast, Fay, Hurst, and White[10] saw debtors as "shrewd maximizers of financial opportunity." Also using a small subset from the PSID (Panel Study of Income Dynamics) dataset, they found no statistically significant relationship between filing decisions and financial shocks, and the likelihood to file was positively related to the financial benefit from filing. Rolsma instead collected data of every case filed in or after FY (Financial Year) 2007, which addressed the issue of sample representativeness.

The sample selection bias issue also exists, as there re contradictory conclusions of the effects of BAPCPA on bankruptcy choices. Lawless et al.[11] found that the means test failed to push high-income debtors from Chapter 7 to 13, and BAPCPA did not change their income profile. Although they used a detailed random sample of 2,500 bankruptcy cases by the Consumer Bankruptcy Project, this dataset is severely biased as it consists entirely of people who have already filed for bankruptcy. Another analysis by Cornwell and Xu[12] used the CPS (Current Population Survey) and ACS (American Community Survey) datasets along with state-level bankruptcy filing rates. Because they did not use case-level data, it could not answer whether BAPCPA made the "right people" move from Chapter 7 to 13. Albanesi and Nosal[13] contradict Cornwell and Xu, as they used a well suited dataset, the Federal Reserve Bank of New York's Consumer Credit Panel dataset, and found that BAPCPA brought a 50% permanent decrease in Chapter 7 filings and no effect on Chapter 13 filings, along with a 25% rise in simple insolvency. Assuming the means test as a barrier, BAPCPA deters potential Chapter 7 filers and leave their insolvency remained. Again, by using comprehensive case-level data, namely administrative data on bankruptcy filings (Integrated Database from Federal Judicial Center, and the Survey of Consumer Finances), Rolsmaaddresses the sample selection issue: his dataset has information both on those who filed and did not file for bankruptcy.

Rolsma extended the random utility maximization model from Domowitz and Sartain. Given the binary nature and the hierarchical structure of the consumer's bankruptcy choice, they chose to use a nested logistic model, which measures more than two outcomes (three in this case). The model uses variables for each household to denote their individual choices using three numbers. Here is the decision tree: the consumers first are to choose from filing for bankruptcy or not, and if yes, they will further choose from Chapter 7 and 13. They have variables that describe household financial status, which are used in the first step, determining filing or not. In addition, they have specific variables relevant to the choice between chapters, which are used in the second step of determining which chapter to file. Rolsma's model uses the basic Bayes' rule[14] on conditional probability, that the posterior probability of an event (bankruptcy filing in this case) is determined by a combination of prior assumptions (the information customers have) and likelihood updaters (the financial status of the households). The model produces the following results.

On the choice of filing or not filing, the model has relatively weak predictive power. It basically confirms the previous conclusion that households with higher incomes are less likely to file for bankruptcy and households with more mortgage debt are more likely. The model also has some surprising bits: Rolsma finds that despite the lack of benefit to filing for bankruptcy in response to student loan debt, higher levels of it are associated with a greater likelihood of filing. Even more curiously, higher credit card debt burdens are associated with a smaller likelihood of choosing to file for bankruptcy.

On the choice between filing for Chapter 7 or Chapter 13 bankruptcy, the model provides excellent predictive power. There is a great level of inconsistency compared to the legislative expectations of BAPCPA. First, having increasing unsecured, non-priority debt burdens in the model predicts a strong inclination towards Chapter 7 and against Chapter 13.

This effect is surprising, because the BAPCPA and its means test should guide the opposite chapter choice direction. Second, different income levels have essentially no impact on chapter choice – the marginal effect of each income level is nearly the same.

“The resounding answer Rolsma gives is that the means tests and the accompanying bankruptcy law reform failed.”

Rolsma notes that these results are consistent with the conclusion from Lawless et al. This argument that the means test is actually quite bad at discriminating between filers, particularly on the basis of income, strongly proves the failure of the means test and BAPCPA itself.

The resounding answer Rolsma gives is that the means tests and the accompanying bankruptcy law reform failed. Near the end of his paper, he concluded that “yet real property possession and income levels, probably the two most important indicators of financial means, do not seem to have the relationship with Chapter 13 choice that they should if the reform was working. Levels of real property value have a relatively small and actually negative relationship with Chapter 13 choice.

Most strikingly, when all the controls in the model are included, the marginal probability of choosing Chapter 13 is nearly identical across income buckets, precisely the opposite of what one would expect the results of the means test to be.”

A lot of important events happened after 2005: the financial crisis, the emergence of e-commerce, e-payment, and digital money, the growth of inequality, the ebbing of U.S. manufacturing, drastic changes in politics both domestically and internationally. All of those events have profound impacts on household wealth, as the fate of individuals is closely tied to the economic and social structures of their country. Perhaps it is time to propose major changes to our bankruptcy laws so that a new mechanism could be designed to guide bankruptcy choices for customers more beneficial to both debtors and creditors.

1. Wathen, J. (2018, October 16). The 9 Biggest Bankruptcies Since 1980. Retrieved from https://www.fool.com/slideshow/9-biggest-bankruptcies-1980

2. Personal bankruptcy. (2019, September 19). Retrieved from https://en.wikipedia.org/wiki/Personal_bankruptcy

3. U.S. Courts. (2018, March 7). Just the Facts: Consumer Bankruptcy Filings, 2006-2017. Retrieved from https://www.uscourts.gov/news/2018/03/07/just-facts-consumer-bankruptcy-filings-2006-2017

4. Drum, K. (2019, September 15). Raw data: Bankruptcies in the US. Retrieved from https://www.motherjones.com/kevin-drum/2019/09/raw-data-bankruptcies-in-the-us

5. Haynes, D. (2019, December 6). History of Bankruptcy in the United States. Retrieved from https://www.thebalance.com/history-of-bankruptcy-in-the-united-states-316225

6. Debt. (2019, November 24). Retrieved from https://en.wikipedia.org/wiki/Debt

7. Majaski, C. (2019, November 18). Unsecured vs. Secured Debts: What’s the Difference? Retrieved from https://www.investopedia.com/ask/answers/110614/what-difference-between-secured-and-unsecured-debts.asp

8. U.S. Department of Justice. (2020, February 11). Means Testing. Retrieved from https://www.justice.gov/ust/means-testing

9. Domowitz, I., & Sartain, R. L. (1999). Determinants of the consumer bankruptcy decision. The Journal of Finance, 54(1), 403-420.

10. Fay, S., Hurst, E., & White, M. J. (2002). The household bankruptcy decision. American Economic Review, 92(3), 706-718.

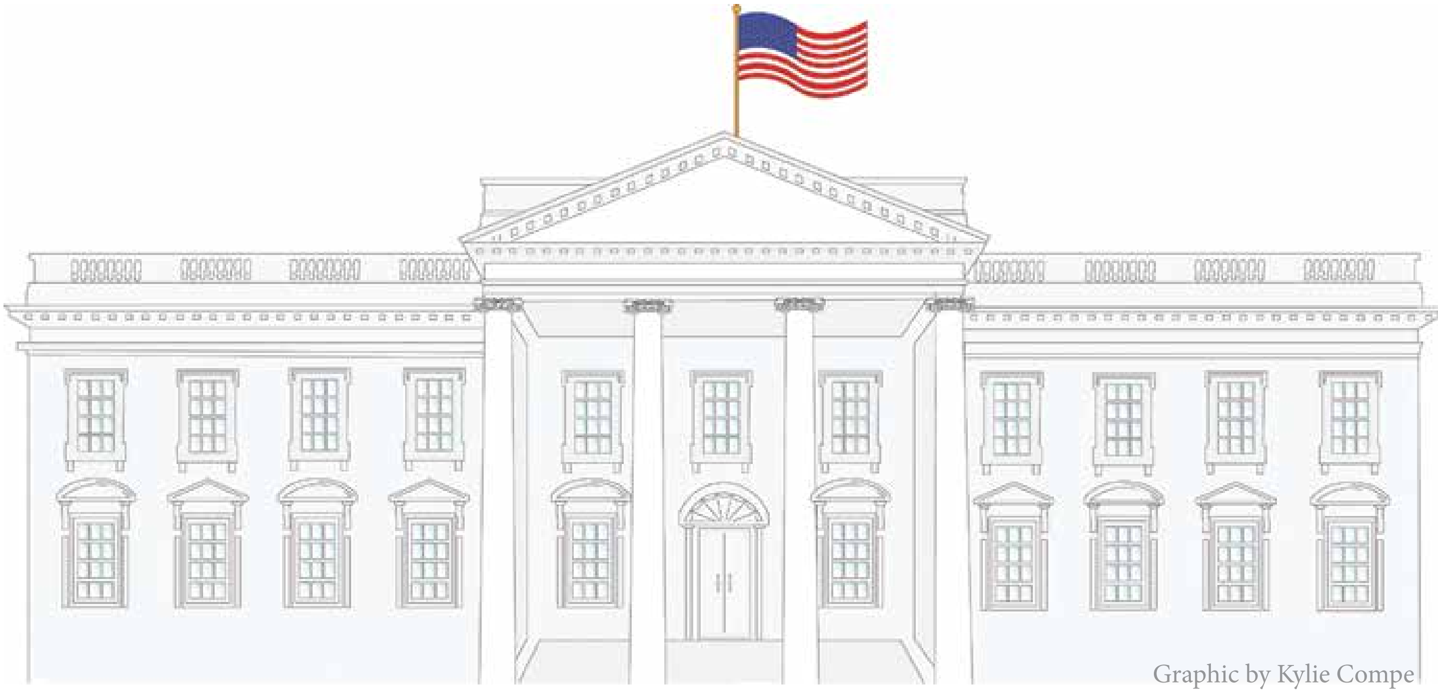
11. Lawless, R. M., Littwin, A. K., Porter, K. M., & Pottow, J. A. (2008). Did Bankruptcy Reform Fail-An Empirical Study of Consumer Debtors. Am. Bankr. LJ, 82, 349.

12. Cornwell, C., & Xu, B. (2014). Effects of the BAPCPA on the chapter composition of consumer bankruptcies. Economics Letters, 124(3), 439-442.

13. Albanesi, S., & Nosal, J. (2018). Insolvency after the 2005 bankruptcy reform (No. w24934). National Bureau of Economic Research.

14. Bayes’ theorem. (2020, January 23). Retrieved from https://en.wikipedia.org/wiki/Bayes%27_theorem

About the researcher: Benjamin Rolsma has worked on research in both economics and political theory as an undergraduate student. He is interested in American insolvency law and consumer lending policy and how it impacts the lives of low-income people. He is also writing on the role and place of ambition and unambition in modern democracies as a 2019-20 Hilldale Fellow. He will graduate in May 2020 and plans to work in consulting or research.



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An Interview with Caroline Liang

Interviewed by Jack Hays

After proving herself as an undergraduate here at the University of Wisconsin-Madison, Caroline continued to follow her aspirations as she quickly found a job at the Council of Economic Advisers (CEA) at the White House. From conducting undergraduate research to being the Editor in Chief for Equilibrium, Caroline has done just about everything and anything to prepare her for the career she is pursuing.

At the CEA, Caroline performs research on topics regarding healthcare and public policy, applying the economic techniques she learned in her classes at UW Madison. Here, she talks more about her love for economics, her journey through her undergraduate career at the University of Wisconsin-Madison, and what it is like to be a research economist at The White House.

What was it about economics that made you decide to pursue it as a career?

I chose to study economics because I first took AP microeconomics in high school, and I thought that the concepts I learned in the class could virtually be applied to any real-world topic. I realized this more and more as I took classes for my major, like macroeconomics and the more specified classes in economics. There was a theme that I saw that a major in economics could provide for. It allows you to understand decision-making processes and policy-making processes. Any problem that requires a decision to be made can be solved using economics, which is what I found to be really fascinating about it.

You were the Editor in Chief for Equilibrium two years ago. Did overseeing the success of the journal provide you with any skills that help you now? If so, how?

When I first started as the Editor in Chief, I had no journalism experience whatsoever, so it was a huge learning curve for me. I also had to build a team from scratch, so it ended up being everyone working together as a team to try and figure it out, to try and get this thing started, and to see it through to completion. I learned a lot of leadership skills and communication skills as well as how to make deadlines and then meet them. These skills have definitely continued with me in my job as a research economist at the CEA. Soft skills-wise I would say the ability to adapt and quickly learn new skills due to having previously no knowledge about journalism or even the journal itself.

What other clubs/activities were you involved in while at UW?

I was involved in the Alexander Hamilton Society which is a foreign policy organization that happened to help me get a lot of my D.C. connections. They're really good at having the members be connected with experts in different policy topics and areas. I got to attend a lot of conferences as well through that, which was always an awesome experience. I also got to lead the club meetings, which would have upwards of over a hundred people attending. I also did undergraduate research in a hematology genetics lab. Additionally, I volunteered at Meriter Hospital. I knew I wanted to go to medical school, so I did these things to check things off the list and provide myself with certain research skills. I was also involved in the Tri-Delta Sorority. In every aspect of my college career, educational, professional, and social, I think I just tried to be involved in as much of what I was interested in as possible.

How did your involvement in the economics department prepare you for your career?

Aside from learning economics, I think the networking was incredibly helpful. I've learned since I've arrived at the Council of Economic Advisers (CEA) that there is a circle of economists, where each economist in the circle knows one another. My health economics professor at Wisconsin knows all the health economists at the CEA. People that I reached out to in the Wisconsin economics department recommended me to fellows at American Enterprise Institute (AEI) who did health weconomics, which, in turn, is connected to the CEA because my former Chairman is also from AEI. There are little connections that you don't realize are there but once you explore them you realize how interconnected the economics space is. I think the economics department also helped me personally by providing me with scholarships, so I didn't have to worry about paying tuition while I was involved in all these clubs and schoolwork. I'm really thankful for that.

Not only did you graduate from UW with an economics degree but also with a degree in biology. Did studying biology provide you with certain techniques that you apply to economics that you otherwise would not?

I think studying biology provided me with certain techniques and knowledge that I could apply to economics that I otherwise wouldn't have known. For example, in evolutionary biology, you learn patterns and trends that help you with data analysis in economics. There is also some overlap between psychology and behavioral economics. You have to make your own connections between the two subjects. Like I said earlier, economics is so applicable that it's more the other way around–studying economics provided me with certain techniques that I can apply to biology that I wouldn't have if I hadn't studied economics.

What qualities and qualifications, do you think, enabled you to go straight into a job like the one you have after graduating from college?

I think that my ability to network and to connect with others to find these opportunities really helped me. I regret not doing any internships of any sort because I was really intent on going to medical school. I spent my summer doing research, taking classes, and volunteering, so I never really went out looking for internships to see what type of jobs there were. Being able to network and ask people for recommendations really helped me to see what was out there and where to apply given my skill set. I think understanding the application process was really important as well. I also think it's important to know that a lot of it is just luck. When I applied for the position I'm in now it just so happened that the former junior economist had decided to leave pretty suddenly, and they needed someone with a specific background. I happened to have that background.

What does it mean to be a research economist at the White House? To what does your research pertain to?

The mission of the CEA is to provide the best, objective economic advice when it comes to domestic and international policy at the White House. I guess my role and everyone's role is to work together as a team in order to support and achieve that mission. Many of the junior economists support the senior economists, who support the Chairman, who relays the messages to other senior staff and the President. Being able to support every person along the way is how I see my job. My research is predominantly in healthcare—healthcare policy and healthcare economic research. This involves analyzing data related to drugs and drug pricing, Medicaid and Medicare enrollment, health insurance, public health, and more than occasionally other topics as well. The agency is pretty small. There's about three dozen of us working full time, so not everybody can cover every single topic that's thrown at us that has to do with domestic and international policy. We all have to try and fill in the holes and learn a lot about different topics to provide the best advice and achieve our mission.

What type of economic theory, principles, and techniques do you use on a day-to-day basis?

Basic theories like supply and demand and price and quantity are used all the time. I don't know about you, but after taking so many economics classes and understanding the basic concepts, I started thinking like an economist. I think of the marginal cost of everything or what would happen if the prices went down or up. For example, the CEA last spring came out with a report about how opioid prices affected opioid use. Before that, the conversation wasn't really about prices, and it was more about prescribing amounts and supply. After some economists looked at it, it became obvious that part of the reason why demand and use for them went up was because the price went down. I think if you know economics well enough, you should be able to apply it to a lot of things.

What does the Council of Economic Advisers hope to accomplish by the end of this year?

I can't speak for the CEA or the White House. Like I said, we try to fulfill our duties to the best of our ability. My personal goal is to learn as much as possible before I leave. This is a once in a lifetime opportunity, so I just want to try and take advantage of being here at the White House. There aren't any deadlines for the end of the calendar year because we follow the Congressional schedule. We usually publish our Economic Report of the President in February, so our biggest goal is to publish that in time without jumping over too many hurdles.

You explained that you would like to go to medical school and become a physician. Do you know where you would like to end up after you get your medical degree?

That's an avenue I've been trying to explore. I've considered doing dual degrees like an MD/MBA or MD/JD. I've reached out to a lot of people to ask them what their opinions are and see what paths people usually take. For example, I spoke with Dr. Scott Gottlieb's research assistant at the AEI, and she told me that Scott had always intended to go the policy route even though he did go through medical school. Other healthcare fellows there, many who are also physicians, practiced for dozens of years before they got into policy and writing. I think it will depend on what I end up enjoying in medical school. Ideally, I'd like to integrate policy and consulting with practicing after getting my medical degree.

You also explained that you would like to "bridge the gaps between physicians, patients, and policy stakeholders." What do you mean by this?

The more I learn and the longer I've been here, the more gaps I see between physicians and patients having a voice in the policy-making process and, even further, policymakers listening to these sorts of people. Ideally, I'd like to be in some sort of position to help bridge those gaps to allow physicians and their patients to have more of a voice when it comes to policymaking and for policy stakeholders to consider these options more. A lot of the time you see small groups of people making impactful policies and deciding on a lot of the nit-picky details without completely understanding who that will affect. Allowing those voices can improve the policy-making process so that fewer people are negatively affected. One other thing I'd like to add is a lot of physicians and patients don't even know how to make their voices heard. There are already avenues for that— there are ways for physicians to be involved in the policy-making process, but a lot of them don't understand how it's done or understand the process. I guess another vision for me then is to be able to provide that sort of knowledge to physicians and patients so their voices can be heard more.

What other connections do you see between economics and biology that you would consider researching?

There are honestly so many. When it comes to biology, a lot of the intersections between economics and biology include public health. The fact that health economics is its own large section of economics gives you an idea of how many topics there are between the two. I think the question is more of what novel ways could you use to answer biological questions with economics. For example, a lot of the economists I work with that have data analysis and coding skills and can easily code ways to look up prices of something, and in healthcare, you have the question of "how can I provide this sort of information to patients better?" The two ideas can be connected, resulting in a product that a healthcare patient can use. It's less about the connections and more about what skills you can use to learn from and apply to the other.

What advice would you give to undergraduate economics students who are looking to do research as a career?

I'd advise them to look for experiences and opportunities they're interested in. Being research assistants and being able to have publications and having writing samples that you can give to display your abilities is a huge asset. It also really depends on whether you want to get a graduate degree or not. I think your plans after undergraduate school really depend on your long-term goals. If you want to follow the research route and become a Ph.D. economist, for example, you want to be prepared to take a lot of math classes, understand mathematics, understand hard economic theory, and be able to do the research you want to do, so you're ready for that sort of career. Alternatively, if you want to consult or go into business, then boosting your communication skills and other strengths like thinking quickly on your feet are important. It really depends on what avenue you want to take because economics is so broad. It also depends on each individual and how they can maximize their abilities to pursue what they want to do in their careers.

Photo courtesy of Caroline Liang

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Los Angeles Metro Rails:

An Asset or a Liability?

Writer Fatima Ali
Researcher Aaron Pawlinski

Throughout the mid-1990s to the early 2000s, Los Angeles experienced a massive population growth, creating traffic congestion in the L.A. highway system. This provided an incentive for lawmakers and city developers to find a method of transportation that would allow a solution to solve the problem of congested highways, while also ensuring that residents had easy and affordable access to transportation. As a result, Los Angeles implemented a Metro Rail system that allowed residents to commute efficiently throughout greater Los Angeles. Metro Rails were found to be a useful public investment. However, developers did not take into account the effect the rail system would have on the surrounding communities and neighborhoods.

Aaron Pawlinski, an undergraduate student at the University of Wisconsin Madison, researched the impacts of the Los Angeles Metro Rail system on the surrounding neighborhoods. Using a differences-in-differences (DID) regression model, he analyzed the effects of the metro rails, placing special emphasis on whether it generated neighborhood change. Pawlinski defined neighborhood change as a change in the income and racial dynamics of a region. At the end of the study, Pawlinski found that the Green, Blue, Purple, and Gold lines did not have any effect on neighborhood change. However, his study had several limitations. Pawlinski stated that the parallel trend assumption may not hold in all cases, that not all L.A. metro lines were studied. Furthermore, he believes that yearly observations and

“The Metro Rails enjoy significant internal economies of scale, and hence are constructed only where the demand is very high.” -Professor Alina Arefeva

a DID model allowing for multiple treatment periods could provide a better estimate of the combined effect of all lines.

There are many benefits to a rail system that lawmakers and city planners aimed to apply as they began the construction of railway systems in Los Angeles. For instance, it was important to increase efficiency by offsetting transportation costs and the time it takes for residents to travel to various parts of Los Angeles, especially hard to reach areas. It creates price competition amongst firms since consumers do not have to rely as much on local producers in order to buy various goods. However, it exposes residents to gentrification. For the purpose of this paper, gentrification is defined as social consequences of major public or private investment. Pawlinski provides a more specific definition of gentrification: “gentrification is viewed as the replacement of a minority or low-income populations in a neighborhood with non-minority or affluent populations preceded by increased cost of living and significant public or private investment.”Author Ruth Glass explains one of the down-sides of gentrification, “Once this process of ‘gentrification’ starts in a district it goes on rapidly until all or most of the original working-class occupiers are displaced and the whole social character of the district is changed”.[1] This process of gentrification is especially evident in Los Angeles, one of the most diverse cities in the United States.

Pawlinski found that no metro line he tested had a significant effect on the surrounding areas. The only significant factor that somewhat fluctuated was the poverty level. He expected that the population density would increase due to residents wanting to move closer to the metro rails, however, it did not.

Another finding was that the average income and rent were unchanged after the creation of the metro rail system. The average rent also appeared unaltered which further showed that the metro line was not a large force for neighborhood change.

In order to further test the effects of metro rails on large cities, and specifically the impacted neighborhoods, it is important to continue studies not only in L.A. but also in other major cities such as New York and Chicago. Many major cities in the United States have transit rail systems or are in the process of renovating or building them. Differences in income and racial compositions will definitely play a role in the effect of metro lines in the near future, but zoning laws and urban layouts will also play a role in the creation of new metro rail systems. Pawlinski found that neighborhood change is most likely not caused by a single investment, but rather by a series of public and private investments. In the future, it is important to examine the effects of zoning laws, legislation, city layout, and demographics.

There are several ways neighborhood change can occur, many of which were not tested in this study. For instance, the composition of neighborhoods and the investments that shape them have large impacts on the economics of cities. City legislation and investments can affect social mobility and economic efficiency. Lastly, the effect of metro rail systems on gentrification can be further studied, especially as more people and their families migrate to larger cities.

When asked about the future of metro rails around the world and especially in the United States, Professor Alina Arefeva of the University of Wisconsin School of Business states that “The Metro Rails enjoy significant internal economies of scale, and hence are constructed only where the demand is very high.” Metro rail systems are suitable for bigger cities such as Los Angeles and Chicago, as they can reduce transportation costs, however, a metro rail system may not be the most effective method of transportation in a smaller city such as Madison with a population that is too small to justify construction. Madison definitely needs an expanded transportation system but increasing bus lines and routes can adequately transport people between Madison and other areas within Dane County.

There are also many issues that developers need to think about before building metro rail systems in large cities. Professor Arefeva stated that a question that developers should be asking is, "How can we make sure that the metro line can actually be constructed under the real estate developments that already exist?" It is likely that property values will go up near the metro line due to residents wanting more access to it; however, property values may decrease rapidly as well due to noise and pollution from building the system. Overall, it is important for developers to run a cost-benefit analysis before beginning the process of developing metro rail systems in large cities. In Los Angeles, residents have found that the metro rail system provides an efficient and affordable form of transportation. However, residents of other cities can respond differently, and the reaction can be negative when it comes to the implementation of a large metro rail system.

1. Glass, R. (1964). London: Aspects of change. London.

Graphic by Kylie Compe

About the researcher: *Aaron's research interests lie in urban economics and more specifically, how public investments shape neighborhood dynamics. He is currently researching whether mixed-income housing units induce changes in the income and racial demographics of neighborhoods. He hopes to continually apply these interests throughout his career.*

Uncovering Vulnerabilities Behind the U.S.-China Trade War

By Anna Steffensen

In the spring of 2018, United States President Donald Trump announced he would begin the biggest and most volatile trade war with the People's Republic of China the modern world has ever seen. Beginning with a 25% tariff on $50 billions of Chinese imports in April of 2018, the trade war took off. Since that day, China and the United States have imposed tit-for-tat tariffs on each other, continuing to escalate a seemingly never-ending trade war that has brought uncertainty and loss to a variety of sectors in both economies, ranging from manufacturing to agriculture to the financial markets. There have been some discussions between China and the United States and the negotiation of a trade truce, but as it stands, the trade war continues to impact consumer choices and global economic instability. Uncertainty involving international tensions and cooperation, namely the U.S.-China Trade War, caused the International Monetary Fund to lower its global growth forecast for 2019 to 3%, down .4% from its prediction at the start of 2019.[1] Since the trade war has had such an immediate effect on financial markets and global economic stability, it is important to understand why the trade war began. From the side of the United States, the reasons President Trump began and since escalated tariffs are due to technology transfer in China, threats to geopolitical influence of the United States, and the stifling of job creation in the United States. These three reasons expose a fundamental unbalance between China and the United States that is a result of decades of dependency on each other's markets to sustain GDP growth and fund budget deficits. This unbalance resulted in the trade war, and it is an unbalance that tariffs and bilateral agreements will not be able to fix on their own.

The accusation that China has used unfair and potentially illegal methods to gain access to United States technology for commercial use is a prominent concern that led to the development of the trade war. There have been reports that for a U.S. company to gain market access to restricted sectors in China, they must set up a joint venture with a Chinese company, and possibly with a company that is subsidized by the Chinese government. Through this joint venture, China gains access to the technology the U.S. company brings to manufacturing its products. This essentially gives China free access to technology whose research and development was funded by U.S. companies and the U.S. government, which is why Trump has named technology transfer as a reason to wage the trade war. Another factor that led to the trade war is the threat that China poses to the United States' geopolitical power. In 1978, China's GDP, the total value of goods and services produced in a country in a given year, was just 6% of the United States' GDP. Following years of unprecedented economic growth and the entry of China into the World Trade Organization, China's GDP in 2018 was 66% of the United States' GDP.[2] Since the 1970s, China's GDP has grown on average 6% each year, while the United States normally grows at a rate of 2%. Similarly, international holdings of Chinese currency have increased, which gives more geopolitical power to China because countries are using Chinese Yuan to trade, rather than the typical currency of trade, U.S. dollars. China has achieved substantial global leadership in many sectors, most notably in technology. This growth in leadership has increased China's influence around the world through projects such as the Belt and Road Initiative and the development of a revolutionary technology venture, Huawei. China's growth was not purely a result of widening their economy, rather is has been a massive movement in technology and innovation that has powered the country's surge. As the U.S. attempts to maintain its number one spot as the world's largest economy and continue to be competitive in a shifting economic and financial environment, China's threat to U.S. economic leadership is a real concern that led to President Trump beginning the trade war.

The stifling of job creation due to companies moving production overseas was one of the most popular foreign policy and employment talking points for Donald Trump in the 2016 Presidential Election. This was a major reason that President Trump began the trade war because through implementing tariffs, he is attempting to raise the price of imported products, therefore, increasing the competitiveness of domestically produced goods and enticing U.S. companies that moved overseas to come back. Manufacturing in the United States has declined and around 7.5 million jobs have been lost since the 1980s.[3] But this brings up a larger question as to why manufacturing declined in the United States and to answer this, it is important to consider the history of trade relations between the United States and China.

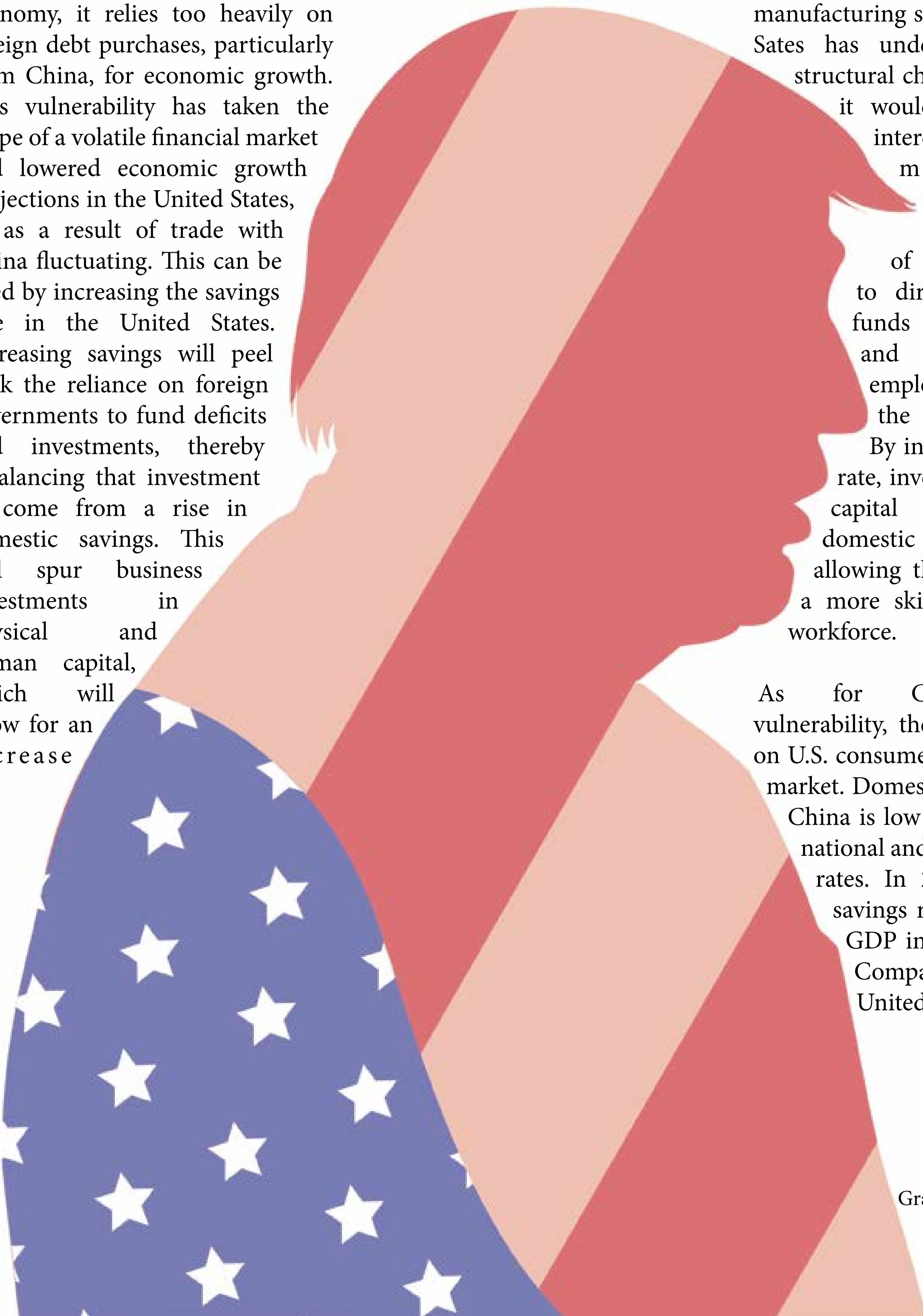
China's threat to U.S. economic leadership is a real concern that led to President Trump beginning the trade war.

After World War II, the United States was experiencing a Golden Age of economic prosperity. Coming out of the war, manufacturing was on the rise and wages rose as income inequality dropped due to a rise in the labor force participation rate, which led to the United States being dubbed the "Workshop of the World". During this time, the United States issued billions of dollars in aid to foreign countries, most notability through the Marshall Plan in Europe and through subsequent plans that supported Japan. This aid helped rebuild countries that were destroyed by the war and it resulted in the rise of two manufacturing powerhouses, Germany and Japan. Now that the United States had competition from abroad, companies began to look for ways to minimize costs and maximize profits to offer goods at the same prices as its foreign competitors. Labor became expensive in the United States during the Golden Age because of the rise in wages due to an increase in productivity. Therefore, companies began to look for ways to decrease labor costs, which led them to move abroad, particularly to East Asia, where labor was inexpensive. China began to see massive economic growth starting in the 1970s when it opened its doors to the world and allowed for foreign manufacturing to enter. In the United States at this time, the federal government budget deficit began to grow due to the Cold War and the Vietnam War. China, looking for ways to maintain U.S. consumption during periods of deficit spending, began to purchase U.S. debt using the recycled profits from the trade surplus. This kept bond prices high and interest rates low in the United States, effectively ensuring that consumption remained high even though the country was in debt. This process of debt purchasing to maintain U.S. consumerism highlights an extreme dependency between China and the United States.[4] China is reliant on the United States as its primary market and the United States is reliant on China to fund its government budget deficit.

This dependency is why a trade war is not the solution to the three reasons that President Trump began the war. If the United States wants to continue to see economic growth and to ensure that China remains prosperous as well, a rebalancing of saving and spending habits will ensure a future of growth in both countries.

China and the United States have massive financial vulnerabilities as a result of their dependence on one another. This trade war has exposed a massive vulnerability in the U.S. economy, it relies too heavily on foreign debt purchases, particularly from China, for economic growth. This vulnerability has taken the shape of a volatile financial market and lowered economic growth projections in the United States, all as a result of trade with China fluctuating. This can be fixed by increasing the savings rate in the United States. Increasing savings will peel back the reliance on foreign governments to fund deficits and investments, thereby rebalancing that investment to come from a rise in domestic savings. This will spur business investments in physical and human capital, which will allow for an increase in job creation in the prosperous service sectors in the United States. Investments in human capital will help populations that have lost jobs due to shifting labor markets and a mismatch of skills that has resulted from the rise of manufacturing moving overseas and automation. This highlights another reason that jobs in manufacturing have declined. Since the rise of automation, jobs in manufacturing have become skilled and many require a college degree, therefore pushing unskilled manufacturing employees out of their jobs. Manufacturing in the United States will not revert back to its 1970s and 1980s level under any circumstances, particularly not as a result of a trade war. The manufacturing sector in the United Sates has undergone a massive structural change and therefore it would be in the best interest of the former manufacturing workforce and the overall stability of the U.S. economy to direct attention and funds to retraining and supporting such employees in adapting to the structural change. By increasing the saving rate, investments in human capital will come from domestic partners, therefore allowing the development of a more skilled and futuristic workforce.

As for China's financial vulnerability, they rely too heavily on U.S. consumers as their primary market. Domestic consumption in China is low and this is seen in national and household savings rates. In 2015, the national savings rate as a percent of GDP in China was 47.1%. Compare that with the United States' rate in the



Graphics by Kylie Compe

same year, which was 4.2%.[5] This difference is savings rate between China and the United States does not just occur at the national level. Household savings rates as a percent of total disposable income in China were 36.14% in 2016, compared to 6.9% in the United States in 2017.[6] The difference in savings rates, and thereby consumption, between the two largest economies in the world is drastic, and this is a result of a frugal Chinese population. China has used profits from the trade surplus with the United States to purchase U.S. debt, rather than invest that money in its citizens or to increase household domestic consumption. China needs to increase its spending rate to maintain economic growth by increasing domestic consumption. By spending more, China can develop welfare programs for its citizens and increase domestic consumption, therefore decreasing its reliance on U.S. consumers for economic growth.[7]

Altering saving and spending rates will not only even out the trade balance, but it would build each economy into sustainable and coexisting superpowers. No longer do China and the United States have to be economic rivals, rather they can cooperate and develop together to ensure economic prosperity for each other and countries around the world. These changes in rates can be included in the bilateral treaty that will be required to end the trade war, which will bring stability and secure future growth in two of the most important economies in the world.

1. International Monetary Fund Research Department. World Economic Outlook, October 2019. International Monetary Fund, 2019.

2. “World Development Indicators.” The World Bank, 2019, databank.worldbank.org/source/world-development-indicators#.

3. Liu, Tao, and Wing Thye Woo. “Understanding the U.S.-China Trade War.” China Economic Journal, vol. 11, no.3, 2018, pp. 319–340., doi:10.1080/17538963.2018.1516256.

4. Sparke, Matthew. Introducing Globalization: Ties, Tensions, and Uneven Integration. Wiley-Blackwell, 2013.

5. OECD (2020), Saving rate (indicator). doi: 10.1787/ff2e64d4-en (Accessed on 15 February 2020)

6. OECD (2020), Household savings (indicator). doi: 10.1787/cfc6f499-en (Accessed on 15 February 2020)

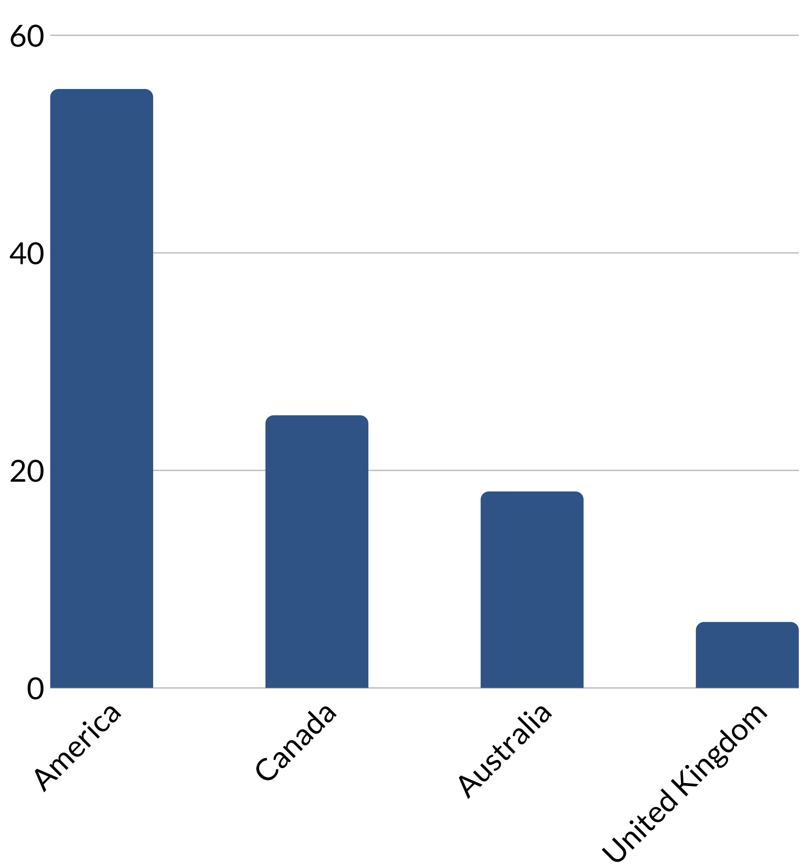
7. Roach, Stephen. Unbalanced. The Co-Dependence of America and China. Yale University Press, 2014.

Religious Densities and Positive Peer Effects on Society

Writer Serene Foo
Researcher Caroline Lamke

"We can't tell the story of America without telling the story of religion," says Peter Manseau, a scholar and curator at the Smithsonian Institution's National Museum of American History.[1] Indeed, religion has played a big part in shaping America's history and politics. Secularization, as with everywhere else in the world, is taking place in America recently. A survey by the Pew Research Center of over 35,000 U.S. adults demonstrated a modest decline in the proportion of U.S. adults who pray daily, regularly attend religious meetings or claim they believe in God, the drop mainly arising from the young generation entering adulthood.[2] In particular, millennials exhibit comparatively lower rates of religiousness, ascribing themselves as religious "nones" in the survey conducted. Yet, America is still relatively a highly religious country, when compared to other wealthy Western countries. According to a 2018 Pew Research Center study, in contrast to other wealthy Western democracies like Australia or Canada, Americans attend weekly religious meetings more frequently, pray more frequently and place greater importance on faith in their lives. To illustrate, 55% of American adults claim to pray daily, while only 25% in Canada, 18% in Australia and 6% in the United Kingdom do so. In fact, out of 102 countries, the United States is the only country with both more than average frequency to pray daily and more than average GDP per capita.[3] Therefore, religion still plays a relatively large role in shaping the future of America.

As explained by Caroline Lamke, an undergraduate economics alum at UW-Madison, religious institutions have had a strong impact on Americans, both economically and behaviorally. She found positive correlations between religiousness and economic outcomes, through the association of religiousness and time and money spent in relationships with neighboring communities, ultimately indirectly facilitating a healthier local economy. Lamke stated that although there is ample literature on religion and peer effects, there is little on correlations between the two. For that reason, she addresses the external peer effects that religious populations impose on non-religious populations, and vice versa, in her research paper, "Religious densities, peer effects, and community-beneficial behaviors."



Peer effects are the social pressures one feels from people around them to conform to specific attitudes, behaviors or values and can include both positive and negative behaviors. As peer pressure is an externality that can increase or decrease societal welfare, it can greatly affect society as a whole. Although peer effects are usually studied within the context of educational institutions, Lamke relates it to community-beneficial behaviors by religious individuals in her paper. While, it is important to note that any peer effects suggested should be taken with reservations as Lamke notes the difficulty in identifying causation in behavioural variables within peer effect theory. Instead, Lamke suggests a smaller-scale approach done within neighborhoods as large-scale results could be the product of regional cultural norms as confounding variables. Besides that, correlations between religious density and community-beneficial behaviors could also arise from potential omitted variable bias like economic conditions. Nonetheless, she infers that, the behaviors of voting, volunteering, and community social interactions have positive correlations with religiousness. Additionally, as religious density increases in a community, these behaviors may suggest a positive peer effect on non-religious individuals, and therefore, non-religious individuals could start behaving in a similar fashion to religious individuals, in these behaviors.

Although determinants of religiosity include response variables, like, "Do you believe in a higher power?" or "Do you believe in God?," Lamke adopts the response variable from the Pew Research Center, "How often do you attend religious services?" implying that religiousness can be represented by the institution. From this perspective, Lamke classifies three types of individuals as non-religious individuals, religious inactives, and religious individuals. Furthermore, although Christianity is the primary religion in the United States, Lamke's study includes all religious individuals, disregarding individual beliefs. Lamke uses data from the General Social Surveys (GSS) from 2012 to 2018, to study religiosity and behaviors of civic duties, volunteering, financial giving, and neighborhood attitudes across the nine regions of the United States.

Lamke examines the marginal effects of religiosity on civic duties,

which include voting in the last three election cycles, rallying for political activism, and attending demonstrations. Lamke infers that as religion density increases, non-religious populations decrease in voting behaviors, while religious inactive populations switch from behaving similarly to religious populations to non-religious populations. Although non-religious and religious inactive individuals are more surrounded by religious individuals, this decrease in voting behavior for non-religious and religious inactive individuals shows a contradictory result as voting is positively correlated with religiousness. Lamke interprets the result as either a bystander effect or as a potential third-factor effect of race, cultural norms, education or others with the norm being to vote less. In general, civic duties of religious individuals suggest a positive peer effect on religious inactive individuals.

Katherine Fox-Glassman, a lecturer at Columbia University's department of psychology, explains the bystander effect by saying that "It's a general term for people not reacting, when they're in a group, to some sort of situation that might call for a reaction — where responsible intervention would be the right call, but no one is intervening."[4] The most cited example of the bystander effect is the ruthless attack and murder of Catherine Genovese, who only received help from the

This decrease in voting behavior for non-religious and religious inactive individuals shows a contradictory result as voting is positively correlated with religiousness.

people hearing her cries after thirty minutes of the attack. Although the results of the bystander effect might not seem as severe in the context of voting behaviors, it reaffirms the powerful impact the bystander effect can have on multiple social behaviors, such as the right to vote, which is the right that appears most frequently in the U.S. Constitution. Therefore, although it is one's responsibility to vote as a citizen of a country, the bystander effect, where one sees many people around them voting, might decrease the likelihood of feeling responsible to vote as well, creating negative results of a decrease in the number of voting. A similar bystander effect can be seen to affect financial giving, as mentioned subsequently. Thus, the bystander effect can help to explain the inconsistency in the data observed.

Lamke also studies the effect of non-religious financial giving, including giving to charitable non-religious institutions, giving to the homeless and lending money to family and friends. Lamke infers that religious inactive populations' behavior on giving to charitable institutions, converges to non-religious populations, rather than religious populations, as religious density increases. Lamke again suggests the bystander effect is taking place here. No correlations were found for giving to the homeless and lending money to family and friends as religious density increases. In general, Lamke does not suggest any correlation or peer effect between religious density and financial giving.

Lamke also studies the effect of social and neighborhood attitudes through the question "Have you spent a social evening with neighbors in the past year?" Lamke finds no clear correlation between religious density and neighborhood social interaction. In general, it was found that the populations of all religiousness behave similarly, despite the increase in religious density. The question of "Do you feel close to your town?" was then used to examine individual attitudes to a town, city, or neighborhood. Although an increase in religion density is slightly positively correlated with feeling close to one's town, Lamke could not find clear correlations between the non-religious, religious inactives, or religious populations to indicate a peer effect.

The results of Lamke's paper suggest a potential peer effect present in religious populations on non-religious populations. The associations of religious and non-religious people suggest certain positive religious principles to be imposed on non-religious individuals. Still, the findings should be taken with a grain of salt as limitations from peer effect theory and missing omitted variable bias could be present. All things considered, can we infer that as we enter the year 2020, America's direction into secularization might decrease the potential positive externalities created by religiosity? Indeed, if these probable positive externalities created by religiosity significantly increases the social welfare of Americans, maybe secularization is not the direction that we want to head in.

1. Gjelten, Tom. "To Understand How Religion Shapes America, Look To Its Early Days." NPR, NPR, 28 June 2017.

2. "U.S. Public Becoming Less Religious." Pew Research Center, 2015.

3. "The Age Gap in Religion Around the World." Pew Research Center, 2018.

4. Levine, Alexandra S. "New York Today: The City's Bystander Effect." The New York Times, The New York Times, 30 July 2018,

About the researcher: Caroline graduated from UW in 2019. She is currently working in consulting as an economic analyst. This summer, she will be a missionary in Zambia, Africa. She plans to go on to study economic development in graduate school.

Sink or Swim

The Economic Effects of Global Warming and Coral Reef Damage

Writer Karina Kloth
Researcher Ruth Cesar Heymann

Photo by Kylie Compe

Over 97 percent of scientists agree that global warming is more than a myth. Instead, the scientific community views the theory more bluntly: excess carbon dioxide is causing the atmosphere to rapidly warm. This simple statement succinctly encapsulates a much larger array of daunting problems. Increased chances of extreme weather, rising sea levels, food supply chain disruptions, loss of freshwater, and frequent wildlife extinction are a few of this statement's implied consequences. Without quick and meaningful action, these consequences will continue to grow in number and severity, making global warming an increasingly important issue.

As atmospheric temperatures rise, so do seawater temperatures. As ocean temperatures rise, the health of underwater reef ecosystems decreases, and the likelihood of severe tropical storms increases. Both of these events may be placing economic stress on developing coastal economies that rely on coral reefs for industry and tourism. The severity of the economic stress is currently under scrutiny, but in the end, finding solutions to global warming could be the difference between sink or swim for many island communities.

Coral, one of the keystone species in reef ecosystems, is known for its brilliant colors and unique structural features which create an image unlike anything to be seen above the rippling tide. People collectively spend billions of dollars each year to experience the beauty of coral and its surrounding habitat. However, coral is very particular and struggles to adapt to changes in its living conditions. Even a slight water temperature increase will cause the species to rapidly deteriorate or "bleach," leaving behind only ghost-like shells of former beauty. Due to high water temperatures caused by global warming, coral reefs all over the world have begun to bleach and subsequently die.

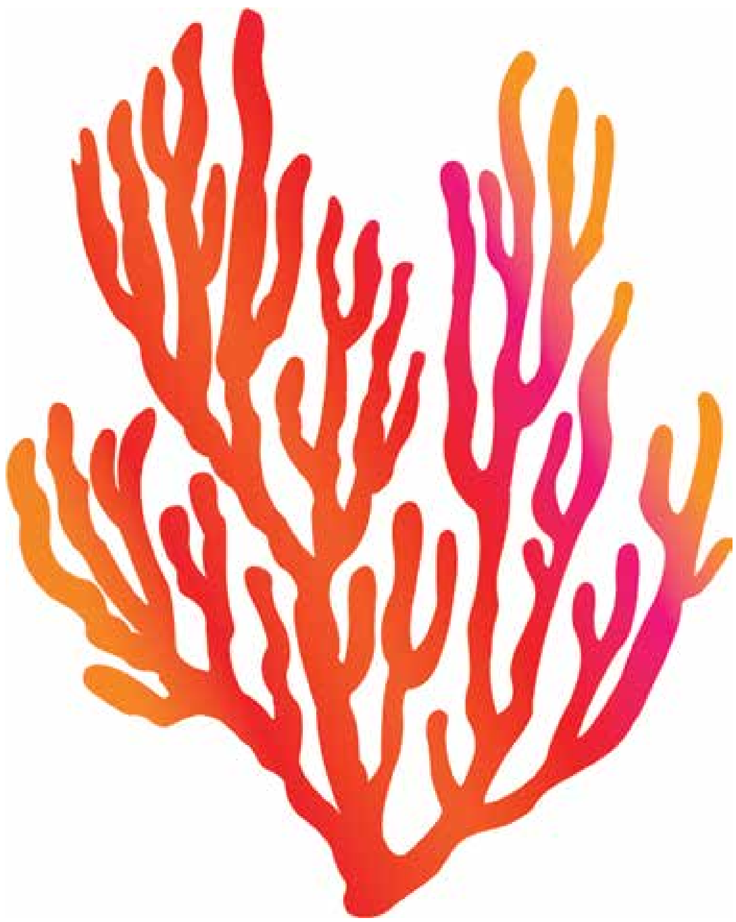
Rising water temperatures due to global warming also directly relate to the likelihood of massive tropical storms in the Pacific. Known as an "El Nino," a single storm holds the potential to cause millions of dollars worth of damage to coastal economies. As surface water temperatures increase, these storms gain in frequency, size, and importance.

The consequences of coral bleaching and "El Nino" both above and below the sea are drastic. Coral reefs are considered an economic asset to many communities. They provide natural buffer zones to coastal cities during tropical storms, profitable fishing industries, eye-catching ecotourism opportunities, and an array of biodiversity which holds potential for future economic endeavors. The culmination of these factors make reef ecosystems the backbone of many island economies, and with the deterioration of coral only predicted to increase as global temperatures continue to rise, these communities could stand to lose much more than just underwater scenery. Similarly, El Nino storms pose a threat to the structural aspects of reef ecosystems, as the intense forces of wind and water can demolish large sections of the habitat in a matter of seconds.

Researchers around the world already agree that damage to coral reefs is having a negative economic impact on developing countries through reductions in the fishing industry and tourism numbers. In particular, tourists looking to scuba dive and snorkel have decreased in areas with extensive damage to their reefs. This harms local economies as substantial numbers of people usually are employed by or own reef touring companies. Whether reef damage is directly linked to coral bleaching, El Ninos, or another alternative can be difficult to decipher, but it is an important distinction to find in order for aid efforts to be utilized most efficiently. However, no matter what the cause, global warming sits at the forefront of the issue.

In the Maldives, a South Asian country located in the Indian Ocean near Sri Lanka, coral reef tourism makes up approximately 30 percent of the economy. With so much of the country's well being reliant on coral reefs, the Maldives have begun to search for a link between coral bleaching and its economy, as 60 percent of the country's reef ecosystems have already succumbed to bleaching.

Ruth Cesar Heymann, an undergraduate studying Mathematics, Computer Science, and Economics at the University of Wisconsin-Madison, took a closer look at the economic connection between the Maldives and their coral reefs in her research paper, "The Effect of Coral Reef Bleaching: A Study of the Maldives Economy." In her paper, Heymann sought out a link between the Maldives economy and the subsequent effects of coral bleaching. Heymann based her analysis on data from the Maldives Visitor Survey, which was collected by the Ministry of Tourism of the Maldives as well as data pertaining to the total number of tourist arrivals to the country, which she obtained from the Maldives Department of Tourism. The Visitor Survey was designed to capture the opinions of visitors to the Maldives and determine the details of their stay. Heymann chose to use data from February 2014, 2015, 2016, 2017 while conducting her research. From this data, she determined the percentage of tourists visiting for four different reasons: snorkeling, diving, honeymoons, or health and wellness. These were the areas in the survey defined by the Ministry of Tourism of the Maldives as significant sources of economic income. She then extrapolated these percentages for each reason monthly over the course of all four years and used these trends for analysis purposes. Limitations in this part of the study are related to the number of people interviewed in each airport, the number of years data was collected, calculations and formulas used to determine the weight of each answer, and the lack of a control island. Heymann's analysis also appears to obtain statistically significant results using only eight data points, later extrapolated (treatment & control observed at four points in time – February 2014, 2015, 2016, and 2017). There is a risk that the significance of her findings may be artificially inflated by this extrapolation unless she has corrected her standard error to account for this. Upon further review, there is no mention of this correction in her write up.



Graphic by Kylie Compe

Heymann selected the Difference in Difference method (DID) to perform her analysis. DID demonstrates the outcome of an event on a 'treatment group' and compares these results to a group not exposed to the event, called the 'control group'. Prior to treatment, both the treatment and control group need to demonstrate parallel trends in order for conclusions to be drawn from DID. Heymann labeled the event to be coral reef damage, and thus set her treatment analysis to occur in January 2017 due to an El Nino storm which occurred in 2016. With these assumptions, she ran several tests on two sets of treatment and control groups before drawing her conclusions.

The first set utilized snorkelers visiting the Maldives as the treatment group and couples vacationing on their honeymoon as the control group. Heymann found that the data for couples on their honeymoon paralleled the trends for those visiting snorkeling attractions prior to treatment but, unlike the snorkelers, should not be affected by coral reef damage. Her second set assigned divers to the treatment group and tourists visiting for health and wellness purposes to the control group; however, she noted that the trends between these two groups were not as well paralleled as in the first set.

After running two DID regressions, one for each set of data, Heymann found the regression between snorkelers and honeymoon couples to be statistically significant at a 95 percent confidence interval. In this first set, the interaction between snorkelers and honeymoon couples yielded a large negative coefficient. This value suggested that tourists coming to the Maldives with the intent of snorkeling decreased due to the coral reef damage caused by bleaching and the 2016 El Nino. Conversely, in her second regression between divers and tourists visiting for health and wellness, Heymann was unable to draw any statistically significant conclusions. She cites an error in her control and treatment group choices as the cause for the lack of significance, as the two trends merge in 2017, thus making them non-comparable using the DID method. Although her intervals were too large to claim certain significance, Heymann emphasizes the importance of the large negative values she calculated as they suggest coral damage having a negative impact on the diver tourism group.

In addition to her DID regressions, Heymann used survey data to calculate the percentage of people annually who qualified activities such as diving or snorkeling as 'good' or 'excellent' from 2014 to 2017. Diving saw a decrease in 2015, 2016 and 2017, while snorkeling ratings decreased in 2016 and 2017. Also, from this survey data, Heymann was able to determine the percentage of tourists coming to visit the Maldives for diving purposes to be decreasing over time, from 19% down to 6% over the course of four years from 2013 to 2017. It is important to note, however, Heymann did not look into the possibility of tourism staying constant overall with tourists switching their reasons for visiting away from diving into another category such as health and wellness.

With these regressions and trends, Heymann estimated the total loss in U.S. dollars to the Maldives economy due to coral reef damage. After calculating, she approximated the loss to be $63 million, although she cited a lack of access to data as a potential cause for error. She also noted that, although diving and snorkeling focused tourism is decreasing, overall tourism to the country is increasing, which could make her findings less noticeable in a broad economic view.

As global temperatures continue to rise, island economies like the Maldives will face more intense pressure on their economies due to coral reef destruction. Although it is difficult to directly cite one cause of reef damage to the overall negative economic impact, it is clear that the overall health of reefs is imperative to the diving and snorkeling tourism industries in many countries, and it is being affected primarily by causes which stem from global warming. Action must be taken to protect these fragile ecosystems, as they are a strong economic asset to many people and hold potential for more economic prosperity in the years to come.

Graphic by Kylie Compe

About the researcher: Ruth was born and raised in Spain and will be graduating from UW in May 2020 with a degree in Economics and Mathematics and a certificate in Computer Science and Environmental Studies. After graduation, she plans to work in software development and data analysis.

A Conversation with Professor Maria Muniagurria

Interviewed by Mathew Attipetty

Professor Maria Muniagurria's work has focused on issues of international trade, economic growth and child health in Latin American. Her research has led to accomplishments that range from policy recommendations to attending numerous international conferences on international trade, and Latin American poverty.

In this interview, Professor Maria Muniagurria provides her initial interest, pursuit, research, and perspective on current events within the realm of Economics.

What manifested your initial interest in economics?

I was born and grew up in a small town in Northeast Argentina. Then when I was in high school
I had a friend who had a brother that studied economics. No one knew about economics in my town, and it sparked my interest. I would have conversations about public policy with him and at the time I was only 16 while they were two or three years ahead of me. With this interest in mind, I had to take a test for aptitude and interest with a psychologist. The results from the test made me decide to move to Buenos Aires and attend the University of Buenos Aires. The major difference in Argentina's universities compared to the United States is that you have to make the decision of your major right out of high school and specialize narrowly in college. At 18 years old, I had to decide which way I wanted to go. I ended up more specialized and experienced a narrow training.

What made you continue research into Economics?

I still find it interesting. What I find interesting is that it has changed over time. I am much more interested in looking at data and interpreting it. Working to acquire information and drawing conclusions from a dataset is fascinating. I view these data sets like puzzles as I try to piece together an explanation of what I am uncovering. Primarily, my focus is looking at the effect on people and I am able to draw connections of data directly to people compared to other studies.

Why did you come to the University of Wisconsin-Madison?

I was at the University of Minnesota during my graduate studies and I loved the Midwest in general. I had a yearning for what I experienced at the University of Minnesota and family inspired me to come to the University of Wisconsin-Madison after living in California.

What is Developmental Economics in general?

The initial stages of Developmental Economics began around 30-40 years ago and the viewpoint was very narrow. For example, how one country goes from a particular level of GDP to another level and big issues regarding policies about agriculture, and whether there should be a closed economy. The macroscale focus was to see how to move a country to a higher transition in production related to agriculture or industry. As time went on, there was discussion about globalization and import substitution. The field widened with issues of health, climate, and the emergence of randomized control trials (RCTs)[1] (this year's Nobel Prize winners' research was based on RCTs). In a nutshell, the field has become more and more diverse, especially with RCTs and it has become more interdisciplinary.

In your research on Child Health and International Engagement in Argentina, the role of family structure in Argentinian preschool children aged 2-5 years had significant outcomes alongside socio-economic variables, can you elaborate on your findings?

Childhood health has a tremendous influence on lifetime income, educational achievement, and quality of life. Together with my co-author Beatriz Novak (demographer at El Colegio de Mexico) we were able to utilize a very large data set that had information on around 30,000 Argentinean children. There is a critical period in which one is young and there are many factors influencing nutritional outcomes. We focused on the case of preschool children 2-4 years old and family structure on outcomes such as being overweight and having (growth) stunting. I did put a lot of emphasis on building an asset index to control for socio-economic status. We found that children with stunting (low height for age) in two-parent families have significantly better outcomes when relatives, mostly grandparents, live with them. The role of the grandparents is better for nutrition because the nutrition improves in the household. However, overweight children in the same setting have significantly higher odds of increasing their obesity later on. It may be because grandparents like to passively feed their kids when they can or because the kids are less physically active when the grandparents are watching them . The advisory policy from our research is to educate and emphasize healthy foods, and exercise for the children and not be so passive towards children. We also found that single-parent families were not bad per se. If you have high socio-economic status and you can supplement resources that the single parent can utilize, then those resources are able to be beneficial toward raising the child. The level of development of the country also played a role within the country as seen from other Latin American countries.

In 2014, Argentina defaulted on its debt. This has been a continuing reoccurrence dating back to 2001 and predictions entail another default is en route for the Argentinian economy. Why does this continue to be an occurrence and what impact has it had on your research?

Argentina is a fascinating and really problematic case that keeps so many economists awake. In summary, the problem of defaulting is a combination of politics, history and economics. Many times the brightest minds try to put the country on a different path, but sometimes the fragile power of whoever tried to implement these measures was the decisive aspect that was behind a failure. The country is characterized by high expenditure for basic public programs, a generous pension system, tax evasion, and

problems with import substitution that closed the economy and made many inefficient industries survive. Governments over time dealt with the same problems: do we have enough money to pay for all these things? How to finance a budget deficit? How do we keep incentives for investment while having a closed economy? All these factors culminated into international borrowing to cover the costs rather than expanding the monetary supply to cause hyperinflation which occurred in 1973 or deeply cutting expenditures. In terms of my research, this did have an effect on my data set since it was collected in 2001 when an extremely serious crisis occurred.

The tariff war conducted by President Trump is now in a procedural phase with stages of tariffs increasing along a timeline. What will be the impacts to consumers and producers?

The costs of the tariffs are large. When a tariff is imposed there are two options. The sellers could keep the same prices for a while and absorb the costs and reduce profit margins. However, the most likely outcome is that prices are going to increase. For the producers, if you're utilizing an intermediate product that is hit by the tariff, then the costs are increasing. Most of these are final good products that are taking the brunt of the tariffs. However, ever since China became a member of the World Trade Organization, there has been a high level of interdependence between the United States and China as these nations have supplied and bought materials from each other for decades now. The optimism that is seen is that the countries will eventually circle back since the dependence is very deep in both countries regarding the trading that has been done so far. There is a risk of a global recession if this type of trading hostility increases.

The Agriculture industry in the United States have seen their exports of Soybeans decrease by 90%, what is the long term impact?

We are in a situation where two countries are trying to inflict damage in the other country. The United States imposed tariffs because there are certain rules the United States wants the Chinese to follow. The Chinese retaliate by imposing their own. We are a large exporter of soybeans to China and they retaliate by imposing tariffs and halting imports of U.S. soybeans by government firms. There is a lot of damage to farmers in the United States in which President Trump is wanting to provide compensation to the farmers, but the Chinese are looking to Latin America to import soybeans from there thus affecting future sales from the United States in regard to this.

The United States cites a prominent issue with China with the forced technology transfer and intellectual property theft that happens in China. Can you elaborate on the situation?

There are cases in which firms are either forced or the government requests for information to be exchanged. Another example comes from Germany where a robotics company was bought by Chinese investors. The patents that they own from the newly acquired company gives them the advantage in supplying the new generation of robotics. There are different things to configure when it comes to this policy. There should be a new way to think about configuring regulations toward intellectual property and technology as these assets are moving beyond the scope of antiquated laws. At the moment the security risk from the technology transfer is low, but it will prominently come up in the future. There are some biological studies that have been transferred to China from universities illegally. However, with all these issues, it's not as widespread as reported, since these sectors are new and they have to be regulated better in the future.

For your work in research, what methods do you employ in order to be successful in what you conclude?

When I'm in the starting phase of my research, it's a real tough curve to get over. When I was in graduate school, they were focused on teaching us and emphasized the transition to an independent idea to research. The training that I had in high school was different than the one in the U.S.. I think it's crucial in doing good things to train your mind since an early age to ask questions such as the why and not focus on memorization. Of course you have to be informed about it, but what I would say is it's super important to evaluate things and ask the right questions about work that has been done by others and what can be improved upon. The methods are to continue to improve the structures and models and try to get your questions answered from those models. It's also important to provide an explanation that can be explained simply and to have the intuition configured alongside your research methods. Use a mathematical or statistical model to answer a question and if you can't find intuition to answer your question, then you will have trouble concluding in your research.

Where do you see your research expanding to in the future, and what advice would you give for undergraduates with similar aspirations?

In future work I hope to continue comparing countries and have time to provide policy recommendations to countries. I would like to have a lot of the questions I have in my mind concluded in some way. I think more and more now, a lot of work in economics is now tied to other disciplines. For example, in health research economists often work with someone with a different background. As technology progresses, economics becomes intertwined with big data and computer science. The most important advice is how do you present stuff. It's best to try to transmit data in few words to an audience and try to make sense of the data. The fewer words that can be explained the better. Another prominent way to expand your thinking about economics is to read outside of economics. Read the paper, follow the news on technology and climate. The need arises from the real world and economists have the tools to make sense of these needs.

Photo courtesy of Maria Muniagurria

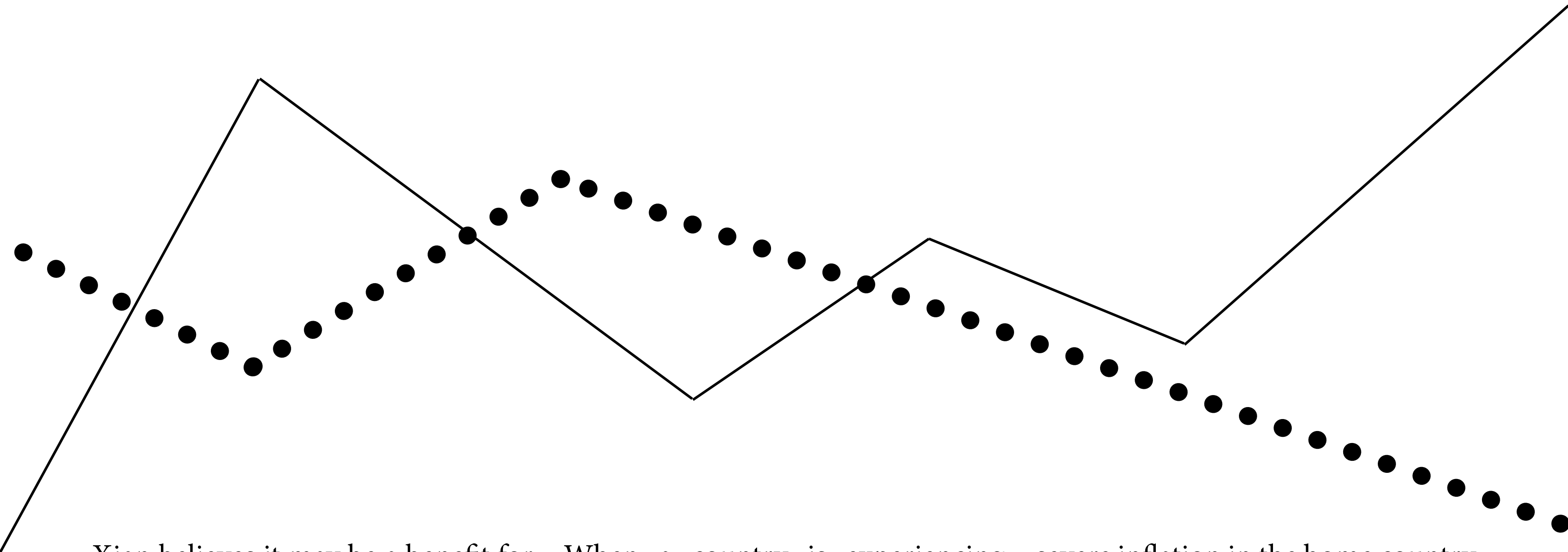
[1] RCTs are a way of reducing bias in an experiment compared to other research methods. This is done by randomly allocating subjects to two or more groups, treating them differently, and then comparing them with respect to a measured response. One group, the experimental group, has the intervention being assessed, while the other, usually called the control group, has an alternative condition, such as no intervention.

Exchange Rate Misalignment:

For Some a Strategy, for Others a Downfall

Writer Abby Fehler
Researcher Diquan Xian

The economies of developing countries face many interesting problems, many of which involve trade. For the leaders of developing nations, economic stability is crucial to maintaining political stability. As seen in countries such as Venezuela, economic instability can cause mass protests, violence, and political turmoil. Therefore, a strong economy is one of the most legitimizing forces for the government of a developing country, and many leaders will go to extreme lengths to maintain a strong economy. Exchange rate misalignment acts as one example. In one way, misalignment can cause the GDP of a country to decrease, and in another, a more purposeful way, exchange rate misalignment can assist in the growth of export-oriented countries, and lead to an increase in GDP. However, this "positive" effect is only temporary and may lead to severe issues in the future. Exchange rate misalignment can be a complex economic problem, requiring immediate government intervention, or it can also be used as an economic strategy, in order to give a temporary illusion of growth. UW-Madison graduate Diquan Xian researched this distinction amongst developing countries in her senior honors thesis paper, "An Attempt to Understand Exchange Rate Misalignment and its Effects on Developing Countries." By better understanding how it works, we can both understand how to prevent it in our own country and learn why



Xian believes it may be a benefit for some countries.

In order to better understand this phenomenon, we must define what misalignment, and more specifically exchange rate misalignment, is. Misalignment is when a variable strays from its long-run sustainable value. When properly aligned, the exchange rate should accurately reflect the ratio of the foreign and domestic price level and is based upon the country's GDP. When studying economics, there is an idea that as related variables change, in this case, the money supply, inflation, and the growth rate, the exchange rate should change accordingly. Misalignment occurs when the exchange rate does not reflect the true condition of the economy, based on the variables it is supposed to be derived from. When an economy is experiencing misalignment, the currency is either undervalued or overvalued. A currency is undervalued when its exchange rate is higher than equilibrium, and a currency is overvalued when its exchange rate is lower than equilibrium.

When a country is experiencing exchange rate misalignment, resource misallocation can occur, as the relative prices paid do not reflect the true relative cost of production. Such a misallocation can lead to economic instability and a reduction in economic welfare. However, when a currency is undervalued, a country can actually receive temporary benefits, primarily through an increase in demand for exports, and therefore, increased economic growth. This phenomenon occurs due to it being relatively cheaper for foreign consumers to purchase undervalued exports. Undervaluation can lead to severe inflation in the home country however, so it is by no means a positive in the long run. Overvaluation has the opposite effect, in which there is a decrease in demand for exports, causing a decrease in economic growth. This phenomenon occurs due to it being relatively more expensive for foreign consumers to purchase the overvalued exports. Therefore, while both types of misalignment can cause resource misallocation, which is obviously a negative effect, undervaluation is relatively more positive in the short run than overvaluation because undervaluation can increase demand for the country's exports.

Misalignment is when a variable strays from its long-run sustainable value.

Exchange rate misalignment can occur as a side effect of the exchange rate regime chosen by the government of a developing country. The two primary choices are a floating exchange rate regime or a fixed rate regime. A floating exchange rate regime allows the rate to change naturally as the economic factors that contribute to the exchange rate change, with minimal government intervention. A fixed exchange rate regime uses government intervention to keep the exchange rate consistent. However, each of these can pose challenges for developing countries. Under a fixed exchange rate regime, developing countries may fail to keep a consistent rate, which could cause a currency crisis. Nonetheless, prices are also much more susceptible to changes in the exchange rate, meaning that a floating exchange rate could cause extreme price instability. Additionally, misalignment can occur when a country using a fixed exchange rate policy possesses a significant nominal deficit, which the central bank attempts to solve by increasing the money supply. This causes inflation and, consequently, real exchange rate appreciation. Xian argues, however, that a fixed exchange rate is still the most appropriate measure to prevent the adverse effects of external shocks, as long as the government uses monetary and fiscal policy that does not conflict with the exchange rate regime. For example, as stated previously, if a government increases the money supply by exorbitant amounts, it would cause the negative effects of rising inflation and the real exchange rate. However, she argues, once the economy grows stronger, they could switch to a floating exchange rate, in order to gain the positive effects that developed countries enjoy from floating rate policies. Though most importantly, developing countries must constantly improve institutions such as the central bank, commercial banking, and policymaking groups, as each of which helps determine the health and growth of a nation's economy. Most of the countries researched by Xian with undervalued currencies were small island nations or key developing countries that have an export-oriented policy. This devaluation is purposeful, she argues, and it is often created by constant management of the exchange rate in order to increase export demand, which in turn increases economic growth. Most of the countries researched by Xian with overvalued currencies were countries that utilized some form of floating exchange rate policy.

Countries can correct undesirable exchange rate misalignment in a few ways. Overvaluation can be corrected by devaluation, which is a purposeful lowering of the value of a currency in order to raise the exchange rate. This strategy can cause a decrease in real domestic output, raise the domestic price level, and cause a negative wealth effect. These effects cause a decrease in domestic demand, a negative side effect of devaluation both as a method to correct misalignment and as a method to increase exports. However, it may still be useful along with other policies in order to combat a decrease in aggregate demand. Another method would be for a country to apply tariffs on imports and subsidies on exports. However, this method could cause a fiscal deficit, as subsidies can cost a government a significant amount of money. Due to the negative side effects of each reparative method, prevention is the key to solving exchange rate misalignment. Yet, this is not always easy for a developing nation without accurate econometric data. Most of the time, when central banks add exchange rate misalignment to their policy goals, it can be prevented.

About the researcher: *Motivated to study economic growth, Diquan investigated how exchange rate misalignment produced by the movement of the real exchange rate prevents or promotes exports. Motivated to understand exchange rate misalignment, she analyzed how exchange rate misalignment generates initial and lagged effects on trade balance. Motivated to discover how developing countries interact with exchange rate misalignment, she explored macroeconomic policies that their governments can implement to control potential negative effects. Diquan graduated from UW in the summer of 2019. She will continue to study political science and prepare for international challenges in this era of remarkable changes.*

The Chinese Housing Market:

Based on Recent Performance, What Does the Future Hold?

Writer Gabe Cohen
Researcher Yiwei Zhao

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Over the last two decades, the housing market in China has enjoyed radical, unprecedented upward growth. Between 2000 and 2017, national average housing prices, adjusted for inflation, increased by a factor of 2, begging the question: why such a sharp increase in prices? There have been many attempts to explain this radical upward growth. Before explaining the outcomes of those attempts, it is important to understand some fundamentals about China's culture, government, and land pricing policy.

Historically, the Chinese government has controlled the market for housing through various policies such as setting the minimum down payment to buy a house, controlling the interest rate, which is non-marketized and controlled by the central government, setting the mortgage rate (effectively a ratio of the interest rate), and setting limits on how many homes can be purchased. In most countries, interest rate setting is a non-politicized process and it is controlled by a central bank in order to prevent politicians from using the interest rate to stimulate the economy, especially during important election years. Typically during economic downturns, the central bank loosens restrictions, allowing more people to invest in the housing market. What follows is a brief history of how the market has responded to housing regulations, monetary policy, and market conditions since the early 2000s.

Between 2003 and 2005, housing prices in China rose sharply. The Chinese government launched two strict housing regulations called "guobatiao" and "guoliutiao" in 2005 and 2006 respectively. These policies aimed to ensure access to affordable housing and to stabilize prices but were overwhelmed by a hot market and ultimately rendered ineffective. In 2007, the government implemented even stricter regulations; in Shanghai, the minimum down payment for a family's first house increased to over 30 percent from 20 percent, and the mortgage interest rate was raised. Paired with tight monetary policy employed by the People's Bank of China (PBC), Chinese housing prices took a sharp downward turn before the global financial crisis in 2008.

When the global financial crisis hit in the latter months of 2008, the market declined even further. The PBC loosened monetary policy in order to encourage investment in housing. They launched the Chinese Economic Stimulus Program, which sharply increased the money supply and encouraged bank loans, and they removed all restrictions on home buying implemented pre-2008. The minimum down payment on a house was lowered to 20 percent. The housing market rebounded quite quickly, peaking in the second quarter of 2009.

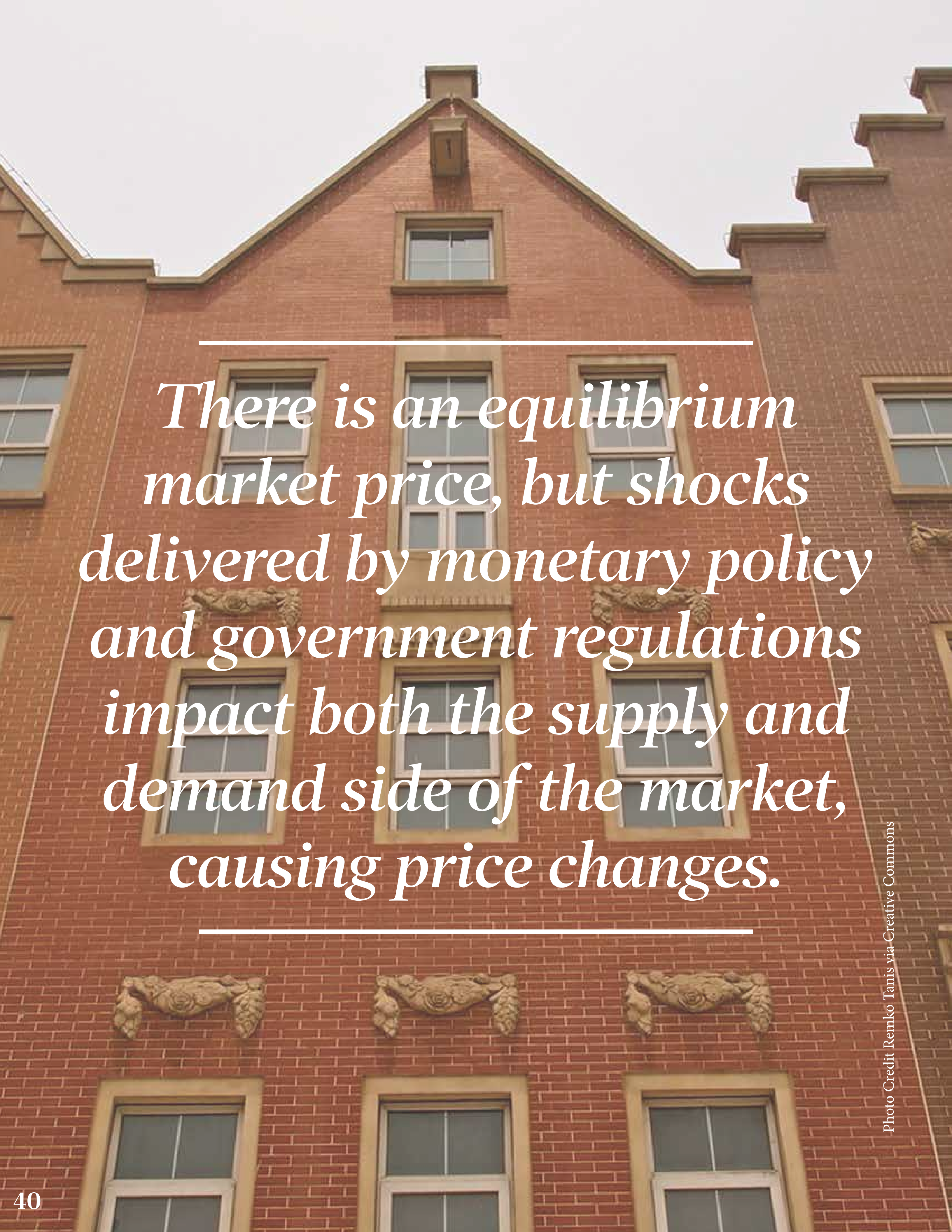
To respond to the fast increase of home prices, in the early months of 2010, the PBC again tightened monetary policy, just as they did following the price increase between 2003 and 2005. The government increased mortgage interest rates to 1.1 times the interest rate and strict purchasing regulations were implemented. These measures were successful in slowing sharply increasing prices. By 2014, growth had slowed and housing sales were down. To respond, the government gradually removed purchasing regulations, and the PBC implemented an expansionary monetary policy. This time, the market did not respond as quickly as it had before. In the beginning of 2016, the house transaction tax was lowered, increasing demand for housing and driving prices up drastically in most metropolitan areas. In response to quickly surging prices, 16 cities launched historically strict home purchasing policies. With limits in buying, lending, selling, prices, land auctions, and new restrictions on changing property type, housing prices began to decline. Due to the fact that these policies were only implemented in certain cities, national housing prices remained quite high due to a demand spillover into cities where the policy was not implemented.

A Model to Predict Future Housing Market Conditions

Consider the housing market as a supply-demand driven market. There is an equilibrium market price, but shocks delivered by monetary policy and government regulations impact both the supply and demand side of the market, causing price changes. We observed these exact dynamics directly above. When the government wanted to change housing prices, they delivered a shock to the market in the form of monetary policy and regulation. In 2005 when prices were high, they implemented heavy regulation, and consequently, the market responded with a lower price.

How can we learn from the price dynamics observed with all this regulation, deregulation, and constantly shifting monetary policy? This is exactly the question Yiwei Zhao grappled with when attempting to construct a model to forecast future housing prices in Shanghai. Based on the dynamics observed between 2000 and 2017, Zhao constructed a model that attempts to forecast future Shanghai housing prices based on the following theoretical framework. On the supply side, a developer's decision to invest in a new housing project is a function of the land purchase price and its expected sale price once it is completed. On the demand side, an assumption is made that due to a lack of a traditional financial market, once an individual can afford to buy a home, they will. In other words, investment in real estate is the tool by which an individual invests. An individual buys a home when it becomes affordable for them to do so. Zhao's supply-demand model determines affordability by a household's wage, current housing prices, and current minimum down payment regulations.

Zhao began to attempt to forecast home prices in Shanghai by running autoregressive models in order to determine the magnitude of the impact of various government policies on the housing price to tackle questions such as how does a 10 percent increase in minimum down payment change overall demand. The first model is a lagged model, which means that Zhao estimated future home prices based on both current and previous periods of policies. As the home market is a living, breathing market, that is, what happened in previous periods informs what happens in current and future periods, Zhao's



There is an equilibrium market price, but shocks delivered by monetary policy and government regulations impact both the supply and demand side of the market, causing price changes.

Photo Credit Remko Tanis via Creative Commons pricing estimates must be based on data spanning across periods.

Zhao found statistically significant impacts on the housing prices in estimators of the impact of land prices, household savings, and minimum down payment on both a household's first and second home. The mortgage rate is a statistically insignificant determinant of housing prices at the 5 percent level. Based on these factors, the model predicted a decrease in housing prices of 0.67 percent over the next 6 months, following a similar trend to 2018. Concerned that the model was insufficient, Zhao added a control for an additional lagged variable which represents monetary policy employed by the PBC. After controlling for monetary policy, the magnitude of her price estimation decreased slightly, predicting a 0.37 percent decrease in housing prices in the upcoming 6 months.

Still unsatisfied with the validity of the model due to some unexpected point estimates, Zhao created a third forecast which aimed to eliminate errors from the first two forecasts to build a stronger, more well-rounded model. After eliminating variables which clouded the results of the first model, stemming from joint causality with housing prices, Zhao also accounted for variables that are not directly linked to the supply or demand side but still may have a significant impact on future housing prices, such as the amount of new construction, planned construction, and household loans. Overall, the model predicts a 0.17 percent increase in housing prices over the following six months. By comparing this result with the previous two models, we can conclude that Zhao predicts prices to remain relatively steady in the coming year, with forecasting estimates ranging between -0.67 percent to 0.17 percent.

Diving a bit deeper into the third model, we are able to see how each individual variable impacts the outcome of the forecast and how that may inform the Shanghai specific market. For example, economic intuition would tell you that an increase in the mortgage rate leads to a decrease in prices due to suppressed demand. Interestingly enough, in Zhao's third model, a unit increase of mortgage rate has a mildly positive effect on housing prices immediately following the increase, and the effect gradually decreases to negative. This begs the question as to why the Chinese market does not behave like a "normal" or "well behaved" housing market when it comes to mortgage rates. The answer may actually be fairly clear.

While most housing markets base mortgage rates on indexed interest rates determined by a central bank, the Chinese central government sets their own interest rates and determine the mortgage based on a given ratio of those interest rates. As we see in Zhao's third model, this practice may have consequences on the behavior of the market which causes it to function differently than what is predicted by neo-classical economic theory. While we are unable to make a causal statement as to the relationship between these two factors, it is an important reminder of the complexity of these markets around the world. It can remind us that while it is easy for many economists to lean on economic intuition to answer questions about a certain market, it is crucially important to critique that intuition in the context of the market under analysis. Though economic intuition is based on sound theory, without supplemental knowledge as to the details of the way markets function, it is risky to make predictions based solely on that economic intuition. There are many factors that impact market dynamics, and if any of those factors are tweaked in any way, such as the government determining interest rates as opposed to the central bank, the market is liable to have unpredictable dynamics.

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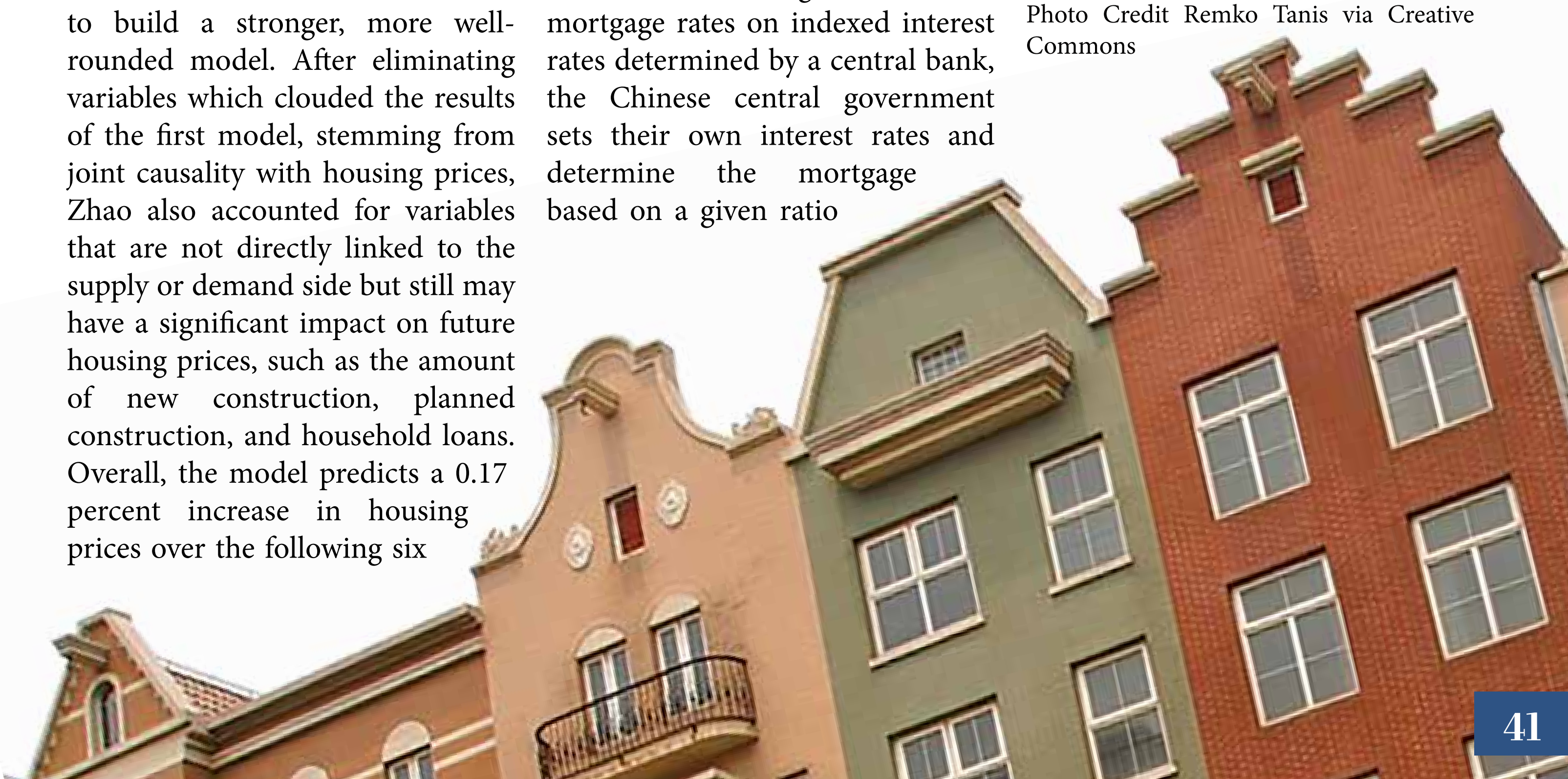

Interest Rates: Why So Negative?

Writer Bulat Schamiloglu

The 2008 financial crisis rattled the world economy. Central banks naturally deployed low interest rates to spur economic growth, but that simply was not enough. In 2014, the European Central Bank (ECB) did something nobody expected: the ECB implemented negative interest rates.

Negative interest rates sound fictional, but this form of monetary policy is currently being used by many central banks across the world. When negative rates are implemented, savers are penalized for keeping their money in a bank, and the borrowers get paid to borrow money. This form of monetary policy is usually implemented when other options are exhausted and economic growth is dire. While negative rates sound like a no brainer for spurring economic growth, there are many costs to consider before deciding if negative rates are actually a useful tool for central banks to use during recession-like circumstances.

Many policymakers, such as President Donald Trump, support negative rates due to the policy's expansionary nature. Despite the United States' interest rates already being low at about 1.25%, President Trump continues to push Chairman Jerome Powell into lowering rates. Leika Kihara and Balazs Koranyi from Reuters, state that negative rates will help weaken a country's currency by making investments in the country less attractive than other countries. Weaker currencies provide the country's exports with a competitive advantage, while also boosting inflation by increasing the price of imports.[2] Also, negative rates decrease the financial industry's margins, making the financial industry one of the biggest losers due to negative rates. Some banks may even offset the loss in revenues by increasing the fees on customers, causing consumers to be more likely to hold their excess reserves in cash. This means consumers could potentially spend their cash, causing economic growth, but the tradeoff is that their money is not secure, as it would be in a bank.

The Bank of Japan (BOJ) and the European Central Bank both have ways of lowering the negative effects of negative rates. The BOJ has adopted a "tiered" system, where the bank charges 0.1% interest only to a small portion of excess reserves that financial institutions deposit with the central bank. Additionally, the bank applies a zero or +0.1% interest rate to the rest of the reserves.[2] The ECB also has its own version of a tiering system that is inspired by the Swiss National Bank. Their system takes a portion of bank deposits (currently set at six times their mandatory reserves) and exempts it from the charge. Within this system, the exemption will result in an annual saving of only 2-3 billion euros for the entire eurozone banking system. That equals only about 1% of these banks' profits last year. Moreover, as excess liquidity is concentrated at larger banks in richer countries, such as Germany and France, the scheme will not benefit all banks equally.[2] If only larger banks can withstand the effects of negative rates, then smaller banks will not be able to operate, or they will push their extra costs onto their customers via fees and or charging them to hold their money in the bank. According to Kenneth Kutter, an economics professor at Williams College, if rates fall too far below zero, individuals and institutions will move a significant volume of funds into cash. This would create an environment where a higher percentage of people's money would not be insured. While this is a risky environment, this high amount of cash holdings could make people more likely to spend money and consume. This increase in consumption could help stimulate the slow economy, which is the end goal of negative rates. Whether negative rates are successful or not depends on if the costs placed on the financial industry is greater than the increase in consumption from the people benefiting from rates.[3] The ECB and the BOJ have both used negative rates and have reaped the rewards and suffered the costs. As their rates are still negative, it is appropriate to analyze the effects of their implementations of negative rates.

The European Central Bank implemented negative rates in 2014 as a short term policy, but in 2019, there were still negative rates being used. The debate for whether negative rates are beneficial or not is pretty vast, but currently, the financial industry is the main voice of opposition against the policy.

European banks have been struggling due to negative rates. Pierre Briançon from Barron's Group, states that initially, the negative rates boosted the value of bonds that banks held on their balance sheets. Also, the negative rates boosted the bank's profitability due to the banks borrowing at shorter terms and cheaper rates for lending to customers at higher rates at a longer period of time. But eventually, the positives turned to negatives because the central bank's policy also aims to bring down long-term rates through quantitative easing.[1] Thanks to the ECB's quantitative easing, long-term rates are at a historic low due to the purchasing of 2 trillion euros of government bonds. Negative rates also left a dent in the European Bank's revenues because 60% of the European banking industry's revenue was made through net interests. The banks that suffer the most are the banks that depend heavily on deposits for the majority of their funding. Fortunately for individuals, eurozone lenders have not spread the effects of negative rates onto their retail customers; these effects would come in the form of adding a fee onto a bank deposit.[1] Despite large disapproval of negative rates from the banking industry, the president of the ECB, Mario Draghi, said that bankers are actually benefiting from negative rates because they have been able to shore up their capital base, decrease the number of nonperforming loans on their balance sheet, and there has been an increase in the demand for credit.[1] Despite negative rates being a "short-term solution" for spurring economic growth, Clemens Fuest, president of the Germany-based Ifo Institute for Economic Research, points out that the European banks have actually benefited from negative rates. Yet again, he mentions that we may get caught in a negative feedback loop that could make it very difficult for the ECB to get back to the more orthodox, positive rates. The ECB has influenced the world with their implementation of negative rates and will most likely continue to use negative rates for at least a couple of more years.

In Japan, consumer prices have been sliding for about 20 years. The sliding consumer prices are hurting corporate revenues, keeping companies from raising wages, or spending money on new projects.[4] The BOJ attempted to stimulate growth by implementing quantitative easing, but the BOJ purchased so many bonds that it unintentionally crowded out the participation from other banks and investors; resulting in Japanese investment banks earning less in commissions from bond trading.[5] In a last-ditch effort to spur growth, the BOJ adopted negative rates in 2016 by charging banks 0.1% on a small portion of their reserves. The negative rates policy hurt banks and made it much more difficult for them to make a profit (margins were cut in half).[5] Their bond yields were also affected by negative rates. The 2-year and the 10-year bond yields went into the negative, meaning that investors lose money by choosing to trade debt. Since the policies' inception in 2016, the negative rates have cost banks on average around $849.66 million in interest paid on reserves. To help pull 10-year bonds away from negative yields, the BOJ decided to implement a policy called yield curve control. This allowed 10-year bonds to move in a slim range of 0.1% above and below zero. This made moves in bond yields so small that trading remained unprofitable. Also, short term bonds remained in the negative, causing bank earnings to be down "20% from their peak in fiscal 2014."[5] The implementation of negative rates spurred short term growth within the Japanese economy, but after a year, the results of negative rates began to fade and started hurting the financial industry.

The results of negative rates are in plain view, extremely short term growth at the expense of long term costs felt mainly by the financial industry. Given the relatively young nature of negative rates, analyzing a true long-term effect on the people of the country is not yet possible. The general consensus is that if banks suffer enough, then they will begin to offset their loss in revenue by charging their individual customers added fees or for holding their money in the bank. Successfully, this could result in people holding their money in cash, potentially spending it and spurring economic growth, and not using the banks. This is the fundamental purpose of negative rates, but when this idea is implemented for a period of time longer than the "short term," the effects can be severe. In addition to the lowered returns of banks, bond yields begin to sink lower and investments begin to shift away from short term and 10-year treasuries. These lower bond yields can hurt low-risk investment funds by lowering their return on investment. Lastly, one of the most dangerous parts about implementing a long term negative rates policy is that when negative rates are no longer short term, it becomes harder to climb out of negative rates, potentially making a dangerous scene for when the next recession comes because the central bank will not be able to lower rates in order to catalyze economic growth. The central banks will have lost one of their most powerful tools in their toolbox. With a looming recession, we must focus our attention on how the ECB and BOJ plan on stimulating growth due to their on-going tug of war with negative rates.

1. Briançon, Pierre. "5 Years Into Negative Rates, Europe's Banks Feel the Pain." Barron's, Barrons, 11 Oct. 2019, www.barrons.com/articles/5-years-into-negative-rates-europes-banks-feel-the-pain-51570831182.

2. Kihara, Leika, and Balazs Koranyi. "Explainer: How Does Negative Interest Rates Policy Work?" Reuters, Thomson Reuters, 13 Sept. 2019, www.reuters.com/article/us-ecb-policy-rates-explainer/explainer-how-does-negative-interest-rates-policy-work-idUSKCN1VY1D2.

3. Kuttner, Kenneth. "How Low Can We Go? The Prospects for Negative Interest Rates." PBS, Public Broadcasting Service, 17 Sept. 2019, www.pbs.org/newshour/economy/making-sense/how-low-can-we-go-the-prospects-for-negative-interest-rates.

4. Soble, Jonathan. "Japan's Negative Interest Rates Explained." The New York Times, The New York Times, 20 Sept. 2016, www.nytimes.com/2016/09/21/business/international/japan-boj-negative-interest-rates.html.

5. White , Stanley. "Why Is Japan's Monetary Policy so Unpopular with Banks?" Reuters, Thomson Reuters, 18 Sept. 2018, www.reuters.com/article/us-japan-economy-boj-explainer/why-is-japans-monetary-policy-so-unpopular-with-banks-idUSKCN1LY34P.

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