

Introduction

James Tobin once said the most important decision a scholar makes is what problems to work on. We’ve entered an era in economic analysis in which trends in inequality levels, especially in the US, are empirically robust and valid (more so for income than wealth). I believe an important progression is to ask, what are the consequences of increasing inequality? My line of inquiry thus focusses on the economic and social effects of inequality. These effects may include macroeconomic phenomena, such as financial market stability and GDP growth, or social phenomena, such as civil conflicts and militarization, or a synthesis of the two, like technological innovation. My research thus operates at a crossroads of many economic disciplines, including macroeconomics, finance, international economics, applied econometrics, development, political economy, and economic history. It also invites collaboration with interdisciplinary scholars (e.g. computer scientists, linguists, historians, sociologists). Methodological approaches are not limited to applied econometric analyses, but include theoretical modeling and qualitative historical perspectives.

With the increasing availability of detailed inequality data, my research creates a new field examining the consequences from changing inequality while simultaneously bridging economic fields and bringing together interdisciplinary researchers. The list below provides brief descriptions of completed research projects, working papers, ongoing work, and directions for future research.

Completed Research

- “*A Network Model of Wealth Inequality and Financial Instability.*” [Job market paper]

How does an economy’s distribution of financial assets impact its stability in the event of a shock? The question is approached from a graph theory perspective whereby financial assets link individuals to form a network. Its topology varies with the level of wealth inequality and total wealth. Both jointly determine network stability in the event of a negative income shock, as simulation results demonstrate. These results are empirically confirmed with long-run panel data for nine countries, showing increasing wealth inequality, in an economy with high levels of aggregate wealth, significantly increases the likelihood of financial crises—particularly stock market crashes. To my knowledge it is the first paper to merge financial network contagion modeling with questions of interpersonal distributions. It thus presents significant research opportunities for the near and long-term, with augmented and increasingly complicated modeling of individual and, eventually, firm behavior.

- “*Application of Social Network Analysis in the Estimation of Bank Financial Strength During the Financial Crisis*” with Morales, M., Brizan, D., Ghaly, H., Ma, M., Reza, S. and A. Rosenberg. (April 2014). *NLP Unshared Task in PoliInformatics 2014*.

This paper, co-authored with several computational linguistics and computer science PhD students, also explores network formation, but empirically. We study the possibility of using a banks social relations to estimate its financial strength during the financial crisis of 2007–2008, applying Natural Language Processing techniques to a corpus of financial and legislative data. The initial result is a social network map of primary actors in the financial crisis, with opportunities for further research on social networks and spatial econometric applications.

Working Papers

- “*Effects of Inequality on the U.S. Current Account: A Long-Run Perspective.*” Working paper, June 2014.

Studying one long-run macroeconomic effect of changing inequality, this paper finds evidence

of a negative cumulative effect of income inequality shocks on the current account position. The current account is also shown to comove with the aggregate wealth-income ratio. In the near-term, this study will be updated to include wealth inequality data from Saez & Zucman's capitalization series from 2015.

- *“Cointegration of US Income Inequality and Financial Sector Size.”* Working paper, December 2013.

I find a positive long-run relationship between income inequality and the financial sector's value added share of GDP, and similar long-run comovement between financial sector size and household indebtedness—a more expected result. Both this paper and the previous one utilize the cointegrated VAR (CVAR) model as a method of finding equilibrium relationships after first specifying, and testing, a valid statistical model of the data. Both also present evidence of far-reaching macroeconomic changes from shifting income distributions.

- *“Income and Wealth Distributions: An Application of Copulas.”* with Hui Liu. Working paper, May 2014.

This paper is a preliminary empirical exploration of measuring distributional changes in income and wealth in the US Survey of Consumer Finances. Copulas pose an attractive tool given their precise estimation of jointly distributed random variables and sensitivity to movements in the tails of those distributions. We find empirical copulas are not well fit at the tops of the joint distribution by any parametric copula, but the Gumbel copula is well-suited for the bottom tail.

Ongoing Research

- *“Instability, Credit, and Inequality in the United States Since 1913.”* [Dissertation essay]

Another methodological application of the CVAR model, this paper tests multiple hypotheses concerning long-run relationships between inequality, credit, and financial instability. The central role of abnormal credit growth in financial crises is well defined, thus we test if this relationship holds statistically, and then expand the model to test if either income or wealth inequality is also a long-run determinant of credit growth or financial instability.

- *“Re-examining the Inequality and Growth Relationship: Evidence from CPS Reported Weekly Earnings Data.”* [Dissertation essay]

I propose an identification strategy that exploits reported household earnings in monthly CPS Basic surveys to study the relationship between inequality and growth. Specific attention is paid to between-industry and occupation variation in earnings inequality and its impact on between-industry or occupation production growth rates. The monthly data provide a novel high frequency data set of earnings inequality, enabling us to explore a slate of additional questions in the near-term. For example, what is the impact of specific financial deregulation legislation or China's entry into the World Trade Organization on income inequality?

Projects with several colleagues, below, capture the breadth of my research agenda, and an expanding network of collaborators.

- *“Inequality as a Cause of Endogenous Imperialism and Militarization: 1870–1913.”* with Professors Branko Milanovic and Suresh Naidu (Columbia)

In this tentatively titled project we study the endogenous effects of within country inequality as a prelude to World War I. We highlight the expansion of military expenditures correlating

with foreign asset wealth in the context of a Hobson-Hilferding-Lenin thesis: within country inequality drove foreign asset accumulation, and thus prompted, we argue, the need for international (armed) enforcement mechanisms.

- *“Is Inequality Innovation Motivation?”* with Russell Funk (Minnesota)

This research begins to explore the effect of inequality on innovation. Economic theory argues a gradient of incomes is necessary to incentivize the technological changes that drive growth. This research will test this motivation hypothesis empirically.

- *“Policing Tactics and Income Inequality: Another Perspective on NYPD Stop & Frisk”*

Begun as a student fellow with the Advanced Research Collaborative (ARC) at the CUNY Graduate Center (and working with the sociologist ARC faculty fellows Sarah Bruch, Iowa, and Marcia Meyers, Washington), this project explores the role of within-neighborhood inequality as a potential factor in policing tactics. It also signals the range of research questions my line of inquiry (effects of inequality) tackles.

Future Research

“All models are wrong, but some are useful” George Box once wrote. My network model is no different. Therefore, my primary aim will be to relax each of three assumptions in the basic interpersonal financial network model and reassess the implications for financial network contagion in the event of a negative income shock. Removing each simplifying assumption increases the model’s complexity while acquiring additional insights into the structural role of wealth inequality on the stability of a financial economy. My hope is the model becomes more useful with each tack.

- *Real asset distributions*

In the basic model, individuals are homogeneous in a single real asset called human capital. All wealth inequality is derived from a skewed distribution of financial claims on other individuals. An important consideration is how a skewed distribution of real assets would also contribute to financial instability in the event of a negative shock to the network. Therefore, one research goal is to consider alternative human capital allocations as well as various distributions of human capital prices (taken as given, not solved for in the model), and re-evaluate the model’s contagion from a negative human capital price shock.

- *Network dynamics*

Critically, the basic network model is static and thus lacks any formation dynamics. Including network formation in the model will add preferential attachment, such that new individuals to the network will seek out financial claims on wealthier individuals. Because the basic model uses a Pareto degree distribution to initially impose an unequal distribution of wealth, our network more accurately depicts top wealth-owning households—a quantile of the distribution who, it could be argued, is likely to participate in preferential attachment and display aspirational financial associations. One question to answer, then, is the role the network’s internal dynamics will play in generating an unstable, or vulnerable, topology. Might they compound or interfere with our earlier inequality findings?

- *Financial intermediaries*

A key simplifying assumption in the basic network model is that nodes represent individuals and financial assets represent claims on future cash flows between individuals. Our model

financial economy thus lacks any financial intermediaries, key components of the real financial economy. The final extension to explore in this network model of inequality and instability is the inclusion of bank nodes in a bipartite network such that individuals are only linked to banks and not each other. Such a model will still incorporate financial inequality between individuals through a degree distribution for the subset of nodes representing individuals, but it will also include a secondary layer of asset distributions that will exist depending on the allocation of assets amongst bank nodes—a much smaller subset of nodes in the network. The focus will be on understanding the interaction between the degree distributions (e.g. when does interpersonal inequality dominate bank network inequality?) as they contribute to contagion in the event of a negative shock.