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Research Interests

Macro-Finance

Academic Experience

Yale University, Department of Economics

Postdoctoral Associate, 2020-

Research: Macroeconomic and Asset Pricing Effects of Supply Chain Disasters.

Advisors: Professor Stefano Giglio and Professor Aleh Tsyvinski.

Ph.D. Economics, University of Minnesota, 2020.

M.A. Economics, New Economic School, 2014.

B.A. Economics, Higher School of Economics, 2012.

Other Research Experience

Federal Reserve Bank of Minneapolis

- Opportunity and Inclusive Growth Institute, Research Analyst, 2017-2020.

Bank of England

- Centre for Central Banking Studies, Academic Visitor, Summer 2019.

Working Papers

1. Smirnyagin, V., Tsyvinski, A. Macroeconomic and Asset Pricing Effects of Supply Chain Disasters, NBER Working Paper 30503, *Submitted*.
2. Smirnyagin, V. Returns to Scale, Firm Entry, and the Business Cycle. Accepted with minor revisions at *Journal of Monetary Economics*.
3. Hyun, J., Park, Z., Smirnyagin, V. Import Competition and Firms' Internal Networks. *Submitted*.
4. Nakajima, M., Smirnyagin, V. Cyclical Labor Income Risk.
5. Schoellman, T., Smirnyagin, V. The Growing Importance of Universities for Patenting and Innovation.

Work in Progress

6. Smirnyagin, V., Tsyvinski, A., Wu, X. Macroeconomic Effects of EPA Regulations.
7. Hyun, J., Kim, D., Lee, Y., Smirnyagin, V. Returns to Scale and Markups: Micro-level Decomposition Using Administrative Data.

Honors & Awards

2019 Heller-Hurwicz Institute Research Grant, University of Minnesota

2017 Best Student Paper Award, Missouri Valley Economic Association

2014 Thomas Sargent Fellowship, University of Minnesota

2014 Best Student in Advanced Macroeconomics and Economic Policy, New Economic School

2012 Graduate Fellowship, New Economic School

Presentations

2022 Yale University, US Census CES, Yale SOM, NASMES (Miami, FL), SEA (Fort Lauderdale, FL)

2021 SEA (New Orleans, LA), Academic Economics Discord, Virtual Macro Seminar, AMES (Curtin), NASMES (UQAM), UEA - Europe, ESEM (Copenhagen), Insper Institute, ex-MOW.

2020 Queen Mary University of London, Banco de Portugal, Higher School of Economics, New Economic School, University of Exeter, University of Minnesota, University of Connecticut, Yale University.

2019 Federal Reserve Bank of Minneapolis, University of Minnesota, Midwest Macro Meeting (East Lansing, MI), Society for Economic Dynamics (St.Louis, MO), Workshop on Dynamic Macro (Vigo, Spain).

2018 Midwest Macro Meeting (Nashville, TN), NASMES (Davis, CA), Midwest Economic Association (Evanston, IL), LACEA (Ecuador), University of Minnesota.

Teaching

Yale University

Intro to Data Analysis and Econometrics (U). Course Director. Fall 2021, Spring 2022, Fall 2022.

Intro to Data Analysis and Econometrics (U). Co-lecturer. Fall 2020, Spring 2021.

University of Minnesota

Intermediate Macroeconomics (U). Instructor. Summer 2017.

Principles of Macroeconomics (U). Instructor. 2016-2017.

Microeconomic Analysis (G). TA. 2015-2016.

Principles of Microeconomics (U). TA. Fall 2014.

Principles of Macroeconomics (U). TA. Spring 2015.

Miscellaneous

Security Clearance: Special Sworn Status, U.S. Census Bureau.

References

Professor Hengjie Ai

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University of Wisconsin-Madison
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Professor V.V. Chari

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Professor Aleh Tsyvinski

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Abstracts

1. Smirnyagin, V., Tsyvinski, A. Macroeconomic and Asset Pricing Effects of Supply Chain Disasters. NBER Working Paper 30503.

Job market paper

We study macroeconomic and asset pricing implications of large negative idiosyncratic jumps—micro disasters—in the context of a general equilibrium production-based asset pricing model with heterogeneous firms.

One contribution of our model is that it jointly delivers firm-level empirical facts emphasized by macroeconomic literature on heterogeneous firms over the business cycle, as well as proper cross-sectional and aggregate asset pricing implications emphasized by the production-based asset pricing finance literature. First, both convex and non-convex capital adjustment frictions allow the model to generate a lumpy investment rate distribution; these adjustment frictions are also important both for the aggregate and cross-sectional behavior of asset prices. Second, idiosyncratic jumps play two key roles. On one hand, they yield heavy tails of employment changes which we document in the data. On the other hand, microeconomic disasters increase volatility of aggregate investment and dividend rates of productive firms by over 20 percent while having virtually no impact on the least productive ones; as a result, jumps represent an important determinant of value and investment premiums. Third, the administrative U.S. Census data on the universe of U.S. firms allows us to precisely parameterize the firm-level shock process, in particular its persistence, which is central to cross-sectional asset pricing implications. Finally, the general equilibrium setting of our model ties the time-series evolution of the marginal utility with an endogenous consumption decision of the household, thereby making the stochastic discount factor internally consistent.

In the second part of the paper, we apply our model to quantitatively study macroeconomic and asset pricing implications of supply chain disruptions and disasters. Global pressures on supply chains have increased substantially and are currently at the historically high levels, as is reflected by virtually all aggregate supply chain indices. One contribution of our paper is to provide a cross-sectional and aggregate analysis of supply chain disruptions and disasters using a novel, large-scale data on the

universe of seaborne U.S. import that cover nearly 200 million transactions and span the time period starting from 2007. An important advantage of this dataset is the exceptionally detailed information accompanying each shipment; three pieces of information are particularly important. First, we use the exact identities of consignees (importers) and shippers (suppliers) to measure supply chain disruptions and disasters at the individual consignee level. Second, we associate each shipment with the ultimate parent company, and merge these parent-level data with Compustat. We find that supply chain disruptions are associated with a pronounced decline in sales growth, and that the share of firms that experience supply chain disruptions is sizable in the bottom part of the sales growth distribution. Third, we use the detailed data on the exact volume of each shipment (in twenty-foot equivalent units, TEUs) to characterize not only the occurrence but also the size distribution of supply chain disruptions. In particular, we are able to measure the prevalence and evolution of both supply chain disruptions and supply chain disasters. We document that, while supply chain disruptions have indeed become more common in the last 3-4 years, the probability of very large disruptions increased even more and nearly doubled over the same time period.

We then quantitatively evaluate the effects of these recent changes that we empirically document. In the aggregate, the effect of higher supply chain disasters is naturally muted as they account for only a small share of all firm-level disasters; we find that the equity premium increases by 0.2pp. However, this effect is highly non-monotonic in the cross-section; in particular, the expected return of high book-to-market firms increases by 0.5pp and of low investment firms by 0.3pp. At the same time, the impact on growth stocks and high investment firms is negligible. We further evaluate the performance of the model by empirically studying the impact of identified supply chain disruptions on realized stock returns and show that disruptions, especially large ones, reduce returns of value stocks more strongly than those of growth stocks. Similarly, identified disruptions reduce returns of low investment firms by more relative to high investment stocks.

2. Smirnyagin, V. Returns to Scale, Firm Entry, and the Business Cycle.

Accepted with minor revisions at *Journal of Monetary Economics*.

Understanding business formation and the determinants of young firms' growth is of vital importance, since the behavior of young firms has sizable aggregate implications. New enterprises constitute a small fraction of employment and fixed assets, but they contribute disproportionately to aggregate job creation and investment. This paper adopts the notion that entrepreneurs choose the efficient scale (measured by returns to scale, RTS) of their projects upon entry, and explores macroeconomic implications of this mechanism by way of embedding it in the otherwise standard firm dynamics framework.

First, I draw on administrative records from the U.S. and use several metrics of RTS to show that the entry rate of businesses with high RTS is more procyclical than that of firms with low RTS; this evidence is consistent with the view that relatively few high-profile businesses get started during economic downturns. Furthermore, in starting new firms, access to financial markets can be critically important; it typically takes time and resources to start new enterprises. This suggests that aggregate financial conditions are likely to affect high RTS firms stronger, since these businesses require more resources to get up to scale. To this end, I separate firms into groups with high and low external financial dependence on the one hand and high and low RTS on the other, and apply the difference-in-difference methodology. I find that adverse financial conditions affect the growth of high RTS firms more strongly.

I then develop a general equilibrium model of firm dynamics in which firms have permanent heterogeneity in RTS; firms that have higher RTS grow faster and eventually get larger, and in this sense have a larger target size. Furthermore, potential entrants can direct their start-up attempts toward projects of different optimal size. I demonstrate that the intensive margin of firm entry is an important propagation mechanism of aggregate fluctuations by way of showing that a version of the model with no entrepreneurial choice of the project type is counterfactual. Besides, I find that the financial shock is the main driver of the compositional effect over the business cycle; the formation of high RTS businesses is particularly sensitive to aggregate financial conditions. I also quantify the importance of the compositional effect for the propagation of aggregate shocks. To this end, I show that the recovery

in the aftermath of a financial shock is delayed by several years in the full model relative to the version of the model with no compositional effect; this occurs due to the “missing” generation of high RTS firms, whereby the lack of these firms becomes more pronounced over time.

3. Hyun, J., Park, Z., Smirnyagin, V. Import Competition and Firms’ Internal Networks.

This paper documents an important role multisector firms play for the cross-sectoral propagation of shocks in the context of the China shock. In particular, we show that employment of an establishment in a given industry is negatively affected by the shock that hits establishments operating in other industries within the same firm. We explore a range of explanations for our findings, highlighting the role of firm diversification and within-firm input-output linkages across sectors. At the sectoral level, the shock that propagates through firms’ internal networks has a sizable impact on industry-level employment dynamics.

4. Nakajima, M., Smirnyagin, V. Cyclical Labor Income Risk.

We investigate cyclicity of variance and skewness of household labor income risk using PSID data. There are five main findings. First, we find that head’s labor income exhibits countercyclical variance and procyclical skewness. Second, cyclicity of hourly wage is muted, suggesting that head’s labor income risk is mainly coming from volatility of hours. Third, younger households face stronger cyclicity of income volatility than older ones, although the level of volatility is lower for the younger ones. Fourth, while the second earner helps lowering the level of skewness, it does not mitigate the volatility of household labor income risk. Meanwhile, government taxes and transfers are found to mitigate the level and cyclicity of labor income risk volatility. Finally, among heads with strong labor market attachment, cyclicity of labor income volatility becomes weaker, while cyclicity of skewness remains.

5. Schoellman, T., Smirnyagin, V. The Growing Importance of Universities for Patenting and Innovation.

We document a growing link between university research and development expenditures and patenting activity in the surrounding metropolitan statistical areas (MSAs) since 1980. The gap in patents per capita between MSAs with and without a research university has doubled, while the elasticity of patents per capita with respect to university R&D has tripled. We establish that this trend reflects growing knowledge spillovers from university R&D by showing that it survives controlling for MSA and university characteristics; that it holds by research/patent field; and that it is stronger in areas where universities do more basic R&D. We show that a portion of this change can be linked to the passage of the Bayh-Dole Act, which was designed in part to improve knowledge flows between universities and firms. The growing importance of teams for leading scientific research and reduction in corporate basic research likely also play a role.