Alejandro Rojas Bernal

Last updated: September 13, 2024

Contact Information

University of Hawai'i at Manoa
Department of Economics
2424 Maile Way, Saunders Hall 531
Honolulu, Hawai'i 96822

Website: www.alejandrorojasbernal.com
Email: rojasber@hawaii.edu
Phone: +1 (808) 956-7071
Nationality: Colombian

Fields

Macroeconomics, International Finance, International Economics, Production Networks

Education

Ph.D. Candidate in Economics - University of British Columbia	Vancouver, Canada
Emphasis in macroeconomics and international finance	2024
Master of Arts in Economics - Universidad de Los Andes	Bogotá, Colombia
Emphasis on finance and econometrics	2018
Bachelor of Arts in Law - Universidad de los Andes	Bogotá, Colombia
Summa Cum Laude	2016
Bachelor of Arts in Economics - Universidad de Los Andes	Bogotá Colombia
Cum Laude	2016

References

Professor Michael B. Devereux
Vancouver School of Economics, UBC
+1 (604) 827 3137
Michael.Devereux@ubc.ca

Professor Jesse Perla
Vancouver School of Economics, UBC
+1 (604) 822 5721
Jesse.Perla@ubc.ca

Professor Amartya Lahiri
Vancouver School of Economics, UBC
+1 (604) 822 8606
Amartya.Lahiri@ubc.ca

Job Market Paper

Inequality and Misallocation under Production Networks

In this paper, I develop an aggregation theory for distorted production network economies with heterogeneous households. I provide general decompositions for how the aggregate and distributional

effects of shocks are sensitive to underlying consumer and firm heterogeneity. The workers' value-added over labor income ratios (distortion centralities) gauge the importance of workers in the production of heavily distorted firms and are sufficient statistics for the effect of income distribution variations on TFP. The average distortion centrality faced by a household's expenditure (expenditure centrality) and a firm's revenue (revenue centrality) are sufficient statistics for the effect of expenditure variations on TFP. Labor misallocation rises and TFP falls as labor income shifts toward high distortion centrality workers, consumption shifts toward high expenditure centrality households, or demand shifts toward high revenue centrality firms. The reason is that when aggregate expenditure on relatively undistorted firms rises, their labor demand increases, reallocating workers from distorted firms with high marginal productivity to relatively undistorted firms with low marginal productivity. These second-best results show how distributional variations affect aggregate output by changing the aggregate allocation efficiency of workers. I estimate the first production network model with household heterogeneity for the United States. I show that variations in the income distribution have been responsible for 20% of the TFP volatility. Additionally, income distribution variations reduced misallocation between 2001 and 2009, and accentuated misallocation after the Great Recession. Heterogeneities in the production network are essential in explaining income and real consumption inequalities.

Working Papers

1. International Misallocation and Comovement under Production Networks

   In this paper, I develop a general aggregation theory that explains the role of production networks in country-level TFP. This theory applies to a distorted production network open economy with endogenous factor supply. My main contribution is to provide decompositions for the country-level TFP variation that account for the possibility that factors of production and dividends cross national boundaries. The country-level TFP depends on sufficient statistics that characterize the effect on domestic real GDP from (i) firm-level productivity and markdown shocks in domestic and foreign firms and (ii) variations in the global income distribution. These decompositions do not require quantity measures of variations, facilitating their empirical implementation, as price data is no longer necessary. Additionally, for an efficient economy, a Hulten type of decomposition exists for each country, and the global sales distribution is a sufficient statistic to characterize the first-order propagation of global shocks on country-level TFP. These results support a theory of economic spillovers and contagion through industrial networks, corroborating the essential role of global value chains in creating strong complementarities and commonalities in business cycles across countries.

2. Growth Through Industrial Linkages

   with Xiaojun Guan

   In this paper, we estimate how changes in the structure of global input-output networks have influenced growth. Using an open economy production network model, we identify sufficient statistics that characterize how productivity shocks across domestic and foreign firms influence country-level TFP. We estimate these sufficient statistics using data on input-output networks and sectoral productivity shocks. Structural changes in global input-output networks between 1965 and 2000 were advantageous for developing countries and unfavorable for advanced economies. Holding the global input-output network fixed, TFP growth in China and India would have been 26.6% and 9.7% lower between 1965 and 2000. Whereas for the US and Australia, TFP growth would have been 4.0% and 16.8% higher. Finally, we show that the dynamics of the domestic intermediate input cost share capture the

importance that the structure of the global input-output network has on the amplification of shocks on TFP. Our analysis illustrates the importance of industrial linkages and robust domestic intermediate input markets for economic growth.

3. Nonlinearities in Production Network Economies with Distortions

   with Ali Karimirad

   We offer the first non-linear analysis of how microeconomic disruptions in an inefficient production network economy impact aggregate TFP. Our decompositions, applicable to any general equilibrium economy, provide non-parametric insights. We identify essential general equilibrium metrics for capturing the non-linear repercussions of microeconomic fluctuations through network connections. Our findings encompass firm-level productivity shocks, wasted distortions, and rebated distortions. We reveal that substantial shocks or high production process complementarity/substitution introduce substantial bias in the linear approximation of distortions and productivity shocks found in the literature. Our non-linear second-order effects substantially mitigate this bias.

4. Stairway To Haven

   This paper attempts to identify the main channels for the propagation of the macroeconomic effects from corporate profit shifting into tax havens. This question is answered by building a general equilibrium model that introduces firm profit shifting to tax havens in a multi-country environment with production networks. In this model, haven jurisdictions specialize and compete for shifted profits by trading concealment assets in a differentiated oligopolistic environment, and non-haven countries defend these profits by setting enforcement levels over capital flows. The central point of the model is that profit shifting introduces two classes of optimal distortions, first, rebated distortions that by modifying the terms of trade and the effective marginal tax rate alter the decision of firms, but also wasted distortions that optimally squander resources via enforcement policies and the corporate costs that firms have to incur in order to access and develop concealment strategies. I show that the main transmission channels for the propagation of these distortions occurs by increasing corporate dividends, the tax base, and wages in tax havens; while non-haven countries are affected by opposite effects in addition to the wasted distortions. We confirm these results in a three country one sector global economy that additionally provides evidence about the relevance of the structure of the production network and the consumption bundle in the magnitude of the effect from introducing profit shifting.

Publications

1. Pricing the exotic: Path-dependent American options with stochastic barriers

   with Mauricio Villamizar-Villegas

   Latin American Journal of Central Banking

   We develop a novel pricing strategy that approximates the value of an American option with exotic features through a portfolio of European options with different maturities. Among our findings, we show that: (i) our model is numerically robust in pricing plain vanilla American options; (ii) the model matches observed bids and premiums of multidimensional options that integrate ratchet, Asian, and barrier characteristics; and (iii) our closed-form approximation allows for an analytical solution of the option's greeks, which characterize the sensitivity to various risk factors. Finally, compared to the traditional Monte Carlo simulations method, we highlight that our estimation's prediction is more accurate and requires less than 1% of the computational time.

Presentations

<div align="center">2023</div>

- North American Summer Meeting of the Econometric Society Meeting, UCLA, Los Angeles
- Asian Meeting of the Econometric Society, East and Southeast Asia, NTU, Singapore
- Australasian Meeting of the Econometric Society, UNSW, Sydney
- Canadian Economic Association, U-Manitoba and U-Winnipeg, Winnipeg

<div align="center">2021</div>

- Quantil: Applied Mathematics Seminar, Bogotá

Teaching Experience

<div align="center">University of British Columbia - Teaching Assistant</div>

- International Finance (Master and PhD), Econ 556, Michael B. Devereux (2023)
- International Macroeconomics and Finance, Econ 456, Michael B. Devereux (2022, 2023)
- Monetary Theory, Econ 447, Geoffrey Newman (2020, 2021, 2022)
- International Finance, Econ 356, Geoffrey Newman (2019, 2020, 2021, 2022)
- Money and Banking, Econ 345, Geoffrey Newman (2023)
- Law and Economics, Econ 367, Sam Norris (2021)

<div align="center">Universidad de Los Andes - Teaching Assistant</div>

- Advanced Econometrics (Master and PhD), Raquel Bernal and Diego Amador (2017, 2018)
- Introduction to Macroeconomics, Marc Hofstetter (2017, 2018)

<div align="center">Universidad de Los Andes - Undergraduate Teaching Assistant</div>

- Financial Derivatives, Jairo Rendon, Financial Derivatives (2016)
- Intermediate Econometrics, Jorge Alexander Bonilla (2015, 2016)
- Constitutional Hermeneutics, Daniel Eduardo Bonilla (2014)
- General Criminal Law, Ricardo Posada (2014)
- Special Crimminal Law, Ricardo Posada (2013)
- General Criminal Law, Yamila Fakhouri (2013)
- Constitutional Law, Diego Eduardo López (2011)
- Roman Law, Nicolás Pájaro (2011)

Professional Experience

- Central Bank of Colombia: Analyst in Financial Markets Development (2016 - 2018)

Scholarships Awards and Honors

<div align="center">2023</div>

- International Tuition Award UBC: $2,633
- Graduate Student Travel Award UBC: $500
- President's Academic Excellence Initiative PhD Award UBC: $475

<div align="center">2022</div>

- Faculty of Arts Graduate Award UBC: $7,511
- Bank of Montreal Graduate Fellowship: $4,583
- International Tuition Award UBC: $3,199
- President's Academic Excellence Initiative PhD Award UBC: $1,620

<div align="center">2021</div>

- Bank of Montreal Graduate Fellowship: $9,166
- International Tuition Award: $3,199
- Kathleen Simpson Memorial Graduate Scholarship: $2,250
- President's Academic Excellence Initiative PhD Award UBC: $515
- Honorable Mention in the Central Bank Award Rodrigo Gómez CEMLA

<div align="center">2020</div>

- AD Scott Fellowship in Economics: $13,325
- Faculty of Arts Graduate Award UBC: $11,775
- International Tuition Award UBC: $5,332
- President's Academic Excellence Initiative PhD Award UBC: $652

<div align="center">2019</div>

- Faculty of Arts Graduate Award UBC: $25,524
- International Tuition Award UBC: $2,133

<div align="center">2016</div>

- Summa Cum Laude in Law: This honorific distinction is given to the students that have a GPA that is in the top 1% of his department in the last 5 years and display comprehensive achievements in an interview with the Academic Council
- Cum Laude in Economics: This honorific distinction is given to the students that have a GPA that is in the top 5% of his department on the last 5 years
- Commencement Speech at the graduation of Law, Architecture, Design and Humanities
- Commencement Speech at the graduation of Economics, Bussiness and Government

<div align="center">2015</div>

- Winner of the Jorge Méndez Munévar 2015 award: Annualy given by the Department of Economics of the University of Los Andes to the student with the best research proyect in all the subjects of the B.A in Economics. This award was given due to the work An Optimal Taylor Rule for Colombia: 2003-2015
- Best National Higher Education Exam (Ecaes) in Law
- Winner of the Cavelier Association Competition and ScholarshipFirst Place in the competition for the best article of investigation in Law, second semester of 2015, with the article "The city, the property and the environment: Colective construction of a sustainable urban space". As a consequence, I won a scholarship for eigth million colombian pesos

Programming

- Julia, Stata, Matlab, R, Arcgis

Languagues

- English (fluent), Spanish (native), German (intermediate)