

Research Statement

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My research fields are international economics, spatial economics, macroeconomics, and financial regulation. I focus my research mainly on analyzing economic interactions over space, identifying and quantifying their driving forces, and deriving policy implications. I use both quantitative (international trade and macroeconomic) models and empirical (micro-econometrics and time series) methods.

Specifically, in my job market paper, *Demographics, Trade, and Growth*, I study how demographic forces have shaped China's trade patterns and economic growth. First, I estimate the effects of demographics and/or trade liberalization on various macroeconomic outcomes using country-level panel regressions and a VARX model. I find that countries with a higher share of working-age population experience higher productivity growth rates and higher savings or investment shares of GDP. Moreover, lower trade costs or a smaller working-age population share are associated with a lower growth rate in the capital-labor ratio. Additionally, the impulse response function (IRF) following a 1 percentage point (p.p.) shock to the young cohort share exhibits a hump-shaped response, indicating that the effects of the shock are transmitted as the cohort ages. Second, I develop an overlapping generations (OLG) trade model to incorporate these empirical findings. Essentially, I embed two mechanisms—age-dependent ability to generate new ideas and age-dependent saving behavior—to explain how demographic change drives shifts in trade patterns and economic growth. This model features essential mechanisms such as relative price effects, comparative advantage, and investment. I calibrate the model with five country groups and five sectors, covering the period from 1970 to 2100, and conduct counterfactual analyses. Utilizing the calibrated model, I quantitatively demonstrate how demographics have historically influenced trade and growth in China and provide model-based projections for the future.

In my more recent work, *The Decline in China's Trade Share of GDP: A Structural Accounting*, I develop and calibrate a multi-sector, multi-region trade model to explain China's trade share of GDP through structural accounting. The model allows for inter-regional-sectoral trade and inter-regional labor flow within China and features three main types of time-varying and region-sector-specific wedges: productivity wedges, trade cost wedges, and labor mobility wedges. In the model, China's trade-to-GDP ratio is fundamentally influenced by its relative productivity compared to foreign countries, trade costs between its regions, international trade costs, and labor supply. The labor supply in each of China's regions is endogenous and primarily depends on migration flows, which, in turn, are influenced by regional productivity and labor mobility costs between China's regions. These factors impact China's trade share of GDP through comparative advantage and specialization. As China's productivity increases, all else being equal, because of comparative advantage forces, China produces more varieties, and its share of total spending on domestic goods will increase; hence, the import share will decline. As labor net outflows increase or labor supply decreases, regions with less labor do not need to specialize in too many goods to be able to consume

the goods they need. The region will specialize in fewer varieties (right tail of the distribution), thus the trade share increases. I find that during the period 2002–2007, declining international trade costs in the heavy industry and productivity growth in foreign regions are the two dominant forces driving the increase in China’s trade share of GDP. The productivity growth in China’s regions is important, but it is more than offset by the first two forces. During the period 2007–2015, China’s productivity growth is the dominant force behind the decrease in its trade share of GDP. At the sector level, changes in productivity in the heavy industry sector, as well as changes in productivity in the services sector, through input-output linkages, are crucial. China’s import trade costs rose in this period, which also contributed to the declining trade share.

Besides quantitative methods, I am also skilled in empirical techniques. In my joint work with Kunyao Xu, we construct topic-specific sentiment indices (expectations regarding COVID, income, unemployment) from 1.2 million U.S. news articles using a Large Language Model. Based on these sentiment indices, we assess the effects of consumer expectations on spending in two ways. First, we estimate the overall effect of sentiment shocks using a regression discontinuity design, with Pfizer’s vaccine announcement date as a breakpoint to establish causal relationships, as it provides an exogenous shock to spending. Second, we conduct a Vector Autoregressive (VAR) analysis to examine the dynamic effects of sentiment shocks. In another collaboration with Alice Ouyang, we examine how Chinese banks respond to various macro-prudential regulations. Using system GMM, we analyze the interrelationships between banks’ capital requirements, liquidity requirements, and capital quality, and how these factors collectively influence bank profitability and risk exposure.

I have also initiated other projects that builds on my previous research. In a project titled *Accounting for China’s Province-Level Border Effects*, I employ both empirical and theoretical methods to quantify the impact of province-border-induced trade costs. Empirically, I use gravity equations to estimate whether provincial borders negatively affect trade flows. These estimated effects are documented and compared across sectors, years, and provinces to analyze their heterogeneous nature. Theoretically, I develop a quantitative trade model that incorporates province-induced trade cost frictions. Using the calibrated model, I quantify the effects of these trade costs on welfare, international trade, and inequality.

In a second project titled *China’s VAT Reforms, Distortions, and Intranational Trade*, I examine whether China’s VAT tax reforms reduce the degree of misallocations. Under this reform, the traditional Business Tax (BT) was replaced by the Value Added Tax (VAT). The tax, which was previously applied to both intermediate and final goods under the BT, now only applies to the value-added portion. This reform may reduce price distortions on firms’ intermediate inputs and affect their output prices, functioning similarly to reduced tariffs when considering China as a network of interlinked regions. This project investigates whether the VAT reform reduces frictions or misallocations and its implications for inequality and welfare within China.

In future work, I plan to build on my ongoing research and I welcome opportunities to collaborate on topics related to my fields of study.