Research Statement

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My research fields are international economics, spatial economics, and macroeconomics. 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, Building on these emprical findings, I develop and calibrate an overlapping generations (OLG) trade model with three key features: age-varying abilities to generate ideas that drive knowledge accumulation, age-varying saving behaviors affecting capital accumulation, and a multi-sector structure that captures both Heckscher-Ohlin and Ricardian comparative advantage within an Eaton-Kortum trade framework. In a counterfactual analysis, I compare China's baseline case to a hypothetical scenario where China's fertility and survival rates align with those of the rest of the world. Results indicate a trade-off in China's unique demographics: short-term gains in capital and income per worker due to a saving-favorable age distribution, along with a stronger comparative advantage in capital-intensive sectors, but a long-term outcome of a lower productivity growth path and income per worker, as a smaller working-age population generates fewer new ideas post-2060.

In my recent work, currently under review for International Economics Review, The Decline in China's Trade Share of GDP: A Structural Accounting, I develop and calibrate a multi-sector, multi-region trade model to account for changes in China's trade share of GDP through structural analysis. 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. Through counterfactual analysis, 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.