

DISSERTATION PROPOSAL

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“Essays in Spatial Economics and Macroeconomic Policy”

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In this dissertation, we study firm heterogeneity and external economies of scale from a spatial perspective in order to discuss the impact and design of macroeconomic policy.

In Chapter 1, we discuss a channel that explains changes in the spatial distribution of production. We document that new business formation has been concentrating in large cities in the U.S. for the past 40 years. To explain this fact, we develop a continuum location model that incorporates an increase in extent of production externalities. In equilibrium, heterogeneous firms sort into different sizes of cities based on ex ante firm productivity. The model generates a Pareto distribution of firm entry due to positive sorting, providing an alternative explanation for city size distribution. Through the model, we can trace how changes in the extent of externalities affect spatial distribution of firm entry.

In Chapter 2, we focus on spatial equilibrium with policy competition. This chapter is motivated by inter-jurisdictional tax/subsidy competition to lure firms to localities (e.g., Amazon HQ2 contest in the U.S.). There has been heated policy discussions regarding whether this type of competition drives the economy away from social optimum. We answer it by developing a theory of spatial general equilibrium with endogenous policy at local and federal level. We use the model to analyze how tax competition affects productivity and the city size distribution via distortions in firm sorting. These distortions suggest that previous estimations on urban productivity premium are subject to caveats when ignoring the endogenous and competitive nature of policy. We characterize the city tax, city size and productivity distributions in both coordinated and uncoordinated regimes. Counterfactual analysis among regimes predicts cost of tax competition. Under plausible conditions, we also analytically characterize optimal policy when taking into account of general equilibrium effects of firms' endogenous choices to locate and produce. We show that existence of tax competition reduces aggregate TFP and city-level TFP. Furthermore, the loss in gross output due to tax competition increases as the wage elasticity of labor supply decreases, or when firms' heterogeneity increases.

In Chapter 3, we explore external economies of scale by analyzing the aggregate and distributional impacts of place-based industrial policies. This chapter is motivated by prevalent policies targeted at boosting growth in specific sectors or regions in developed and developing countries. We aim at further opening the black box of agglomeration and discussing effectiveness of these policies. We begin by documenting new facts about regional concentration and sectoral specialization in China. We examine how industrial structure and firms' production respond to a policy shock in high-tech industries and in targeted locations. Preliminary empirical evidence motivates an idea to differentiate technology and supply chain channels from an agglomeration externality channel. To this end, we plan to develop a quantitative general equilibrium model to understand these forces and decompose their relative strengths. The model will speak to inter- and intra-industry reallocation within and across locations, which predicts both intended and

unintended effects of place-based industrial policies. Taking the model to data, we will illustrate how productivity distribution, spatial inequality and aggregate growth are shaped by various driving forces. The quantitative part will provide rationales to conduct macroeconomic policies by measuring how regional or sectoral interventions affect welfare when policies interact with external economies of scale.