Research Statement

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My research lies at the intersection of urban economics, the economics of organizations, international trade and labor economics. My existing papers study two types of questions. First, I consider descriptively, theoretically and empirically how and why firm decisions about establishment location and factor allocations between establishments have changed over time. Second, I consider quantitatively the incidence of local zoning and land use restrictions on workers of different skill levels in the context of an urban economic geography model. Here I briefly describe these two main elements of my existing research and discuss expected directions for future research.

1 The Internal Spatial Organization of Firms

Firms with multiple establishments play an increasingly important role in the economy. For instance, while approximately 7% of all the private firms in Denmark in 2016 were multi-establishment, these firms generated about 50% of private-sector employment. These shares have increased since the 1980s in many developed economies. In addition, these firms typically locate their headquarters in denser urban areas. As a result, how these firms organize their activities across space has important consequences for local labor markets and a country's economic geography.

Ditte Lyngemark (Kraks Fond Institute for Urban Economics Research, Copenhagen) and I investigate a number of aspects regarding the internal spatial organization of firms. We tackle these questions using matched employer-employee register data for Denmark between 1981 and 2016. With these data, we can follow every Danish establishment throughout its life, link it to its firm, observe its location and characterize its workforce in terms of workers' attributes.

Our first paper studies how the location and occupational composition of establishments within firms have changed since 1980. In particular, we document an increase in the spatial fragmentation of Danish firms along several dimensions. First, the average number of establishments per firm increased by 37% for firms in the manufacturing and service sectors. Second, the average distance between establishments and headquarters (HQ) increased by more than 200%, while the average share of employment held at firms' HQ decreased by around 10%. Third, these changes are mainly driven by a decentralization of production and business service workers. Fourth, the ratio of managers to production and clerical workers has increased, especially in those establishments located in the main municipalities. This finding suggests an increase in establishment specialization within firms across locations. We show that these changes have contributed to the relative concentration of managers in the metropolitan area of Copenhagen.

My job market paper investigates how exogenous changes in relative wages within and across locations, communication costs and agglomeration economies affect firms' choices of number of establishments and factor allocation between them. In addition to the findings from our first paper, we are motivated by the fact that headquarters have become more manager intensive relative to other establishments, despite a significant increase in managerial wages at HQ locations. In particular, between 1996 and 2011, the ratio

of managers to workers increased by 18% at firms' HQ, relative to satellite establishments, while the wage of managers at the HQ, relative to non-HQ, increased by 15%.

To understand these facts, we build a model in which a firm chooses the number of establishments and the location and labor composition of each one of them. The model builds on the multinational firms' literature and includes a within-firm public good that is manager intensive and only produced at the HQ. This non-rival good generates within-firm economies of scale that encourage firm expansion, including the creation of multiple establishments. Wage differences between HQ and other locations also create an incentive to open new establishments and substitute labor out of the HQ to places with relatively low wages. By opening new units, firms incur extra fixed costs of production and communication, and could miss out on productivity advantages present at the HQ location. The model suggests that increasing wage differences between HQ and satellite establishments lead to an increase in the size of the latter. This increase in size generates an increase in the demand for HQ services. Therefore, an increase in the price of managers at HQ locations could lead to a more manager intensive HQ through these firm scale effects.

We estimate the key elasticities and model parameters using a novel commuting-augmented immigration instrument as the source of identifying variation for changes in the labor supply of managers and workers across and within municipalities. We find an average elasticity of substitution across establishments of 3 for workers and 0 for managers. To the best of our knowledge, these are the first estimates of across-establishment elasticities of substitution in the literature. Moreover, we find that increases in the wage of managers at HQ, relative to non-HQ establishments, can explain 50% of the increase in the observed HQ managerial intensity, while the standard labor demand channel only explains 30%. These results emphasize the importance of firm level scale economies interacted with rising relative wages for managers in HQ locations, as suggested before. This evidence also suggests that, compared with single-establishment firms, multi-establishment firms have an extra channel through which they can react to exogenous wage changes. Finally, simulations indicate that changes in wage gaps across locations lead to more establishments per firm and this effect strengthens as communication costs fall.

Following this line of research, we are currently exploring three other projects. First, we intend to study how shocks to transportation costs and agglomeration economies the spatial structure of firms. For this project, we will use the opening of the Great Belt Bridge in Denmark in 1998 as an exogenous shock affecting transportation costs between municipalities. Recent research has shown that this bridge stimulated economic activity in the two main municipalities at the expense of regions closer to the bridge. This trend can be explained by our current model, which predicts that lower fragmentation costs leads to an increase in the number of establishments in order to take advantage of lower factor prices or higher agglomeration economies at other locations. We intend to quantify the role of these two mechanisms in explaining this trend.

Second, we plan to study how local housing prices change when multi-establishment firms open or close establishments in a municipality. We consider that a new establishment might increase the competition for local floor space both directly (own use) and indirectly (workers' use). For identification, we will use the 2007 Danish Structural Reform, which restructured the entire public sector, including the amalgamation of 217 municipalities into 98 and 13 states into 5 regions. Since this reform increased

centralization of the public sector, it arguably made some municipalities relatively more appealing for establishment location. Third, we will put together what we learn from this research agenda papers to construct a quantitative spatial equilibrium model to study the role of multi-establishment firms' location and labor choices in local economies. This model will allow us to evaluate the impact of different policies on firm fragmentation and on the economic geography of a country.

2 Differential Impacts of Land Use Regulations

In another line of research, I study the impacts of land use regulations on worker welfare by skill. Regulations on the use of land are prevalent in almost any city in the modern world and can affect households not only though housing prices but also through their location choices and the wages firms offer. Moreover, given the large contrasts within cities, land use regulations might affect different types of workers differently. For instance, the effects could be different for high skilled relative to low skilled workers due to differences in occupations, commuting costs and housing expenditures shares.

This paper studies the effects of zoning and height restrictions on the location choices, housing prices and welfare of high and low skilled workers across locations. To study these issues, I build a quantitative spatial model of a city. The model predicts that residential zoning has an ambiguous effect on the welfare of both types of workers since it lowers both residential rents and wages. On the other hand, height restrictions lead to higher housing prices and lower wages, which lead to a decrease in the welfare of low skilled workers but could benefit high skilled workers through an increase in their non-labor income.

This project uses block level commuting and zoning data for the City of Chicago between 2009 and 2016, together with the universe of real estate transactions. This data will allow me to test the predictions of the model, estimate it and perform different counterfactuals. Although I am still working in the empirical implementation, for identification I rely on the panel structure of the data, from which I observe zoning amendments at a fine geographic level, together with historical land prices as instrumental variables for changes in land use regulations.

Potential applications of the model include the assessment of different zoning policies in Chicago such as the increasing high-rise residential developments in the Gold Coast district, or the high-tech manufacturing developments planned in the Near West End. Moreover, this model can be applied to other cities with available zoning data at a fine geographic scale. This paper will attempt to contribute to the debate on whether zoning is a regressive measure, and if it possible to identify a group of the population that benefits from it.