Research Statement

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I am a public economist with interest in the distribution of economic activities and competition across space. In my research, I study the location decisions and pricing strategies of gasoline retailers in the United States. I use state tax differences to understand the long-term effect of these tax policies on the entry of retail establishments and local competition. Also, I analyze the pricing strategies within retail gasoline markets to assess the nature of competition in these markets. I have a secondary interest in labor economics and income inequality. My research focuses on answering economically-relevant questions using applied/spatial econometric methods.

Current Research

In my job market paper, *"Behavioral Responses to Spatial Tax Notches in the Retail Gasoline Market,"* I analyze how taxes affect business location decisions and local competition. A notable feature in previous literature is the lack of consensus as to the extent to which taxes deter business entrance. Taxation could discourage business entry if after-tax profits are more favorable in other jurisdictions. However, higher taxes might not hurt business entry if, for example, tax revenues are spent on public goods that improve business activity. The retail gasoline industry faces significant fuel tax differences across state borders that make it possible to revisit this classic debate near state borders. My research provides direct evidence of the effects of taxes on the location choices of firms and their competitors, and the consequences for pass-through of taxes to prices. I answer two economically-relevant questions. First, how do state tax differences affect the entry and location decisions of retailers? Second, what are the effects of these differences on the distribution of the tax burdens between buyers and sellers?

To addresses these questions, I use a unique dataset on retail gasoline prices and fueling station locations collected by an automated extraction of data from a network of websites between March 2017 and April 2018. My analysis accounts for important local regulations and policies beyond taxation, such as minimum wage, gasoline requirements, and price-gouging laws, that also change at state boundaries. I arrive at two main results that were previously overlooked by past literature. First, the expected number of fueling stations rises by 30 percent when crossing into the low-tax side of a state border. That is, controlling for local characteristics, the number of firms is significantly lower on the high-tax side. Second, within 15 miles of a state border, gasoline consumers bear 75 percent of the fuel tax on the high-tax side, as compared to 100 percent on the low-tax side within the same distance. The incomplete pass-through of gasoline taxes to consumers suggests that competition on the high-tax side is weaker than on the low-tax side, where the number of retailers is larger. These results suggest that retailers on the high-tax side receive more of their business from relatively inelastic shoppers.

Other parts of my research focus on the pricing strategies of gasoline retailers within markets. The empirical literature on retail gasoline finds markets with asymmetric price cycles where slow price declines follow sharp price increases. *"Pricing Strategy Heterogeneity in Retail Gasoline Markets,"* co-authored with a fellow student Julia González, studies the asymmetric price dynamics within retail gasoline markets using fueling stations as the unit of analysis. Previous literature that attempted to identify the sources of price differences across gasoline retailers focused on variables such as firm characteristics, gasoline brand, geographic differentiation, and market concentration. However, the previous literature used average market level prices that have unobservable confounders. In the paper, we overcome that identification concern by analyzing the asymmetric price cycles at the fueling station level. We develop a new indicator to measure the asymmetric price cycles at the fueling station level. The differences in cyclin behavior at the station level provide us with a

new source of variation that identifies a cycling-induced price gap of -3.4 cents within the same market. This unique identification strategy sheds light on the debate between the competitive (i.e., Edgeworth cycles) versus the collusive explanation for these cycles. We further contribute by showing that the type of consumer targeted by stations is related to the station's pricing strategy: non-cycling stations seek to attract inelastic consumers, while cycling stations target price-sensitive, search-prone consumers.

As an economist, I am also concerned with the increasing patterns of income inequality that we observe in developing countries as well as in developed economies. *"Understanding Sources of Wage Inequality: Additive Decomposition of the Gini Coefficient Using Quantile Regression,"* develops a new methodology to determine the contribution of various factors to the inequality on the distribution of wages in the United States. I use the relationship between the conditional Gini index and the conditional quantile function to develop my method. Starting with a linear model to explain the conditional quantile function in terms of covariates, I use polynomial approximations of the estimates of the conditional quantile regression coefficients to determine the factors that contribute most to the inequality of the distribution. I use data on hourly wages in the United States from the Ongoing Rotation Group of the Current Population Survey to show that changes in educational attainment are related to reductions in wage inequality, especially for workers with an associate degree.

Future Research

My research shows the strategic responses of gasoline retailers to state tax differences. The empirical findings shed light on how these tax differences alter the distribution of the burdens between buyers and sellers. However, the costs of inter-jurisdictional shopping, tax avoidance, and lower competition are part of the deadweight loss that alters the welfare cost of gasoline taxation near borders. Calculating the social welfare cost of these taxes, including search costs of consumers and lower competition in a segment of the market, seems to be a fruitful area for further research. In future research, I will develop a theoretical model to rationalize my empirical findings. The economic model will predict the incomplete bunching of gasoline retailers on the low-tax side of the border as well as incomplete pass-through of taxes to prices on the high-tax side. With this framework, I will be able to provide insights into the distortionary impacts of taxation in a context of imperfect firm mobility and consumers with heterogeneous sensitivity to prices. The model will provide a framework for the estimation of parameters that are also linked to the empirical literature in industrial organization and spatial competition.

Using also a structural approach, I plan to estimate structural parameters to measure behavioral responses to taxation in rental housing markets. A notable feature of the literature studying these responses is the maintained analysis of the supply or demand market in isolation, assuming the other market is perfectly elastic. I will exploit a distinctive feature of the tax code in the Tehran rental market, where the tax-exemption threshold depends on the property's size, to develop a model to estimate the price elasticities of housing size supply and demand simultaneously. In the theoretical framework, taxes will be on owners and will depend on the size of the housing unit. The framework will allow for passing forward some of the tax burden to renters via higher rents, and it will allow for tax-induced changes in the number of properties around the kink. The model will be identified by the substantial bunching below the tax cutoff observed in a comprehensive dataset on housing transactions in Tehran.

On a longer timescale, I plan to use my comprehensive dataset of gasoline retailers in the United States to study other exciting questions. The propensity of the gasoline retailers to locate on the low-tax side of the border generates demand for land only on one edge of the jurisdictional boundary. I hypothesize that this increases land prices only on the low-tax side of the border. Understanding this unintended consequence of regulation is relevant from a policy perspective. Verifying this hypothesis is difficult because many other

factors could also affect land values. I will use the exogenous implementation of the Clean Air Act as a plausible instrument for the shock. The 1990 amendments to the Clean Air Act introduced gasoline requirements and regulation that explain the fuel tax differences across states in a way that seems to be uncorrelated with land values. I will exploit this characteristic of the regulation to identify the effects of substantial fuel tax differences on land values.

Also, from my research on the heterogeneous pricing strategies in the retail gasoline markets, I identify markets with high shares of synchronized cycling stations that charge smaller prices than fueling stations with non-cycling pricing strategies. The literature refers to the theoretical explanation of this pricing behavior as Edgeworth cycles. This theoretical model explains the cycling behavior of prices as the outcome of a competitive equilibrium model where retailers engage in a price war until they reach the competitive price; there, a relenting phase starts where retailers randomize between setting marginal cost or restoring prices. A testable prediction of this theory is the randomness of the reestablishment of high prices. My dataset of gasoline retailers in the United States does not support this prediction of randomness. On the contrary, I find strong weekly patterns in the asymmetric cycle dynamics that are more likely to have price increases on specific days of the week. Therefore, a natural extension of my research will pursue a theoretical explanation in light of this new evidence.

Despite my detailed data on the location of the fueling stations in the United States and their corresponding retail gasoline prices, I will complement this dataset with additional information to assess relevant questions that I can not answer now. The Oil Price Information Service (OPIS) provides pricing data on retail gasoline. They have detailed information on the brand of gasoline that the gasoline retailers sell, even for fueling stations that are not part of a retail chain. They also have information on the wholesale price and transportation cost from the nearest gasoline terminal. Throughout negotiations with OPIS, I arranged to buy a portion of the data. I will apply as a 'young faculty' to get a grant from the Hayek Fund for Scholars to purchase this dataset. With these new data, I will be able to compute margins and control for vertical business relations. Observing the dynamics of the wholesale gasoline prices can inform on the pricing strategies of the gasoline retailers and the pass-through of costs to consumer prices.