



BROWN

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November 14, 2021

Research Statement

My professional mission is to contribute to public welfare by providing rigorous empirical evidence and tools to design effective public policy. I am fascinated by how large-scale government intervention can shape markets and the human behavior that drives them. In my research, I am driven to investigate the extent to which these interventions actually do what they are designed to do. My research focuses on understanding market responses, evaluating costs, and exploring the unintended consequences of large-scale investments in infrastructure. I use settings that allow for credible and compelling research designs. My research combines the best available statistical tools, economic models, and new data sources. I have been focused on testing and evaluating the efficacy of commonly assumed beliefs using empirical evidence and appropriate economic frameworks throughout my research career.

For example, one widespread belief is that the USA highway infrastructure has a *cost disease* and is crumbling. In Mehrotra, Turner, and Uribe (2021), we interrogate those beliefs using unique data containing detailed characteristics of each lane mile of the US Interstate Highway System (IHS). We measure the bumpiness of the IHS over time and estimate the cost of building and maintaining the IHS. We find a cost increase for new construction and resurfacing the existing highways. Over the fifteen-year study period, building new lane miles became five times more expensive and resurfacing existing lanes is two times more expensive. We find suggestive evidence that the cost increase can be explained by factors associated with how lanes are built. We were able to reject popular conjectures that pavement durability, institutional and regulatory environment, or input prices explain the rise in the costs of building new lanes. Finally, we develop an optimal capital stock model for the interstate highway system to evaluate trends in the user cost of capital.

This research is important for several reasons. First, infrastructure policy is subject to an active policy debate. Second, the project uses data and economic analysis to reject the common assumption that the Interstate Highways are getting worse. Finally, existing estimates of the cost of building and maintaining highways are surprisingly rudimentary. Our research provides a more precise cost evaluation, which enables a more accurate cost-benefit analysis.

In my Job Market Paper (JMP), I find an ideal context to combine my research interests. Housing affordability is a pressing issue across the globe. In the past several decades, governments around the world have adopted market-based strategies to encourage home ownership. Common strategies include down payment assistance, zero percent interest rates, and subsidies to developers to build affordable housing. The assumption is that a market-based strategy is more efficient than direct government intervention. While policy-makers adopt these approaches on that premise, little is known about how the market actually responds to these interventions. It is difficult to create accurate models that can isolate the policy's effects on the housing market

and the human behavior that drives it. This is due to several empirical and theoretical challenges. I found an ideal setting in Colombian housing policy to address these challenges. The policy is designed to promote housing for low-income families, but its design is similar to some first-time home buyer programs in the United States and Europe. In this setting, I am able to evaluate the housing market response to a housing price-capped policy. This price cap allows me to study the behavioral responses induced by the policy. Because the policy offers subsidies and tax incentives to both developers and households, I am able to adapt a model to untangle the supply and demand responses to this policy. The massive expansion of this policy over my study period allows me to provide compelling evidence that the behavioral responses I observe are actually caused by the policy.

Using unique data containing the universe of new construction projects and administrative records from the Ministry of Housing, I find bunching at the price cutoff and as the subsidy increases its eligibility and size, the market response is more pronounced. The market share of units sold at the price cutoff increased from one percent to seven percent of the market. I use techniques used in the bunching literature to estimate the distribution that would exist in the absence of the subsidy. Using this distribution, I find that the price cutoff combined with the tax incentive and subsidies is distorting the incentives of developers and households, who build and buy smaller housing units to comply with the maximum price that defines eligibility. They buy or build units up to 30 percent smaller to benefit from the policy scheme.

I introduce a housing equilibrium model allowing for product differentiation and agent heterogeneity and a novel identification strategy to recover the model primitives. The model rationalizes the market response. The identification relies on the behavioural responses induced by the subsidy. I use marginal conditions and the estimated behavioural effects to estimate the parameters describing the cost and utility functions of the model. The economic model and estimated parameters allow me to evaluate the welfare effects of the policy and study the potential impacts of alternative policies such as removing the price threshold, imposing a minimum size limit, or removing tax benefits.

Focusing on the agents responding to the policy, I find that the benefits to households responding to the subsidies did not increase during my study period despite the increase in the size of the subsidy. On the developer side, removing the tax incentives will generate a provisioning problem, particularly by the end of my study period. Developers would have a 14 percent decrease in their profits, leading them to avoid producing low-cost housing.

The paper makes important methodological contributions to the bunching and hedonic equilibrium models literature, but more importantly, provides new empirical and theoretical insights on a first-order question. The findings of this paper inform the design of an effective housing policy that is fundamental to providing affordable housing.

In a separate but related paper, I study the effects of a location-based redistribution policy on the housing market in Bogotá, Colombia. The policy was designed to ease the financial burden of utility payments for low-income homeowners and renters. In Bogotá, like many cities in the developing world, it is difficult to identify low-income residents, because many of them do not participate in formal labor markets. In some cases, there are no pay stubs or tax returns to assist in identifying the people who would benefit from welfare programs. To address this challenge, policymakers in Bogotá chose to use neighborhood quality as a proxy for income. Each neighborhood in the city was assessed and given a neighborhood quality index. Residents of neighborhoods with high quality scores pay above the market rate for utilities and neighborhoods with low quality scores are subsidized and therefore pay less. While it was designed as a redistributive welfare program, its design induced unintended effects on the housing market. Using a Regression Discontinuity Design, I find that the difference in subsidy levels across neighborhoods induces new construction in highly subsidized areas. As predicted by the theory, housing prices are higher in these areas, which ends up canceling out the utility subsidy for renters.

This research is important because it provides rigorous empirical evidence to support the urban economist mantra *subsidize people, not places*. This type of evidence is required to inform the renewed interest in using location as a targeting tool to implement redistributive policies and welfare programs. Understanding the interaction between housing markets and redistributive policies has implications in many settings. Similar research designs may be used to understand location-based policies like school redistricting, the placement of green energy infrastructure, and the designation of communities as economic Opportunity Zones. More generally, my work also underscores the importance of accounting for potential unintended consequences when evaluating the potential of a policy.

In other papers, I have looked at assumptions in initiatives to improve educational outcomes. In these papers, my coauthors and I combine the universe of standardized test scores with other data sources to evaluate the effects of increasing universities and expanding internet access on human capital accumulation.

In Camacho, Messina, and Uribe 2021, we find that students graduating from newly created higher education programs have sixteen percent lower wages than students graduating from existing programs. The common assumption is that the quality of these newly created programs is inferior to existing programs. The popular concern in news media and in political rhetoric is that these programs are essentially money-making schemes designed to produce profits rather than people prepared for the labor market. However, we find that the observable characteristics of students and programs almost entirely explain this unconditional wage difference. New programs are created in areas of study with lower returns and attract students with lower potential earnings.

In Uribe and Weisbrod 2021, my coauthor and I explore internet expansion's impact on educational outcomes. We use variation over time and an instrumental variable

approach exploiting the costliness of extending the existing internet infrastructure to connect new areas. We then identify the causal impacts of internet access on test scores. A natural assumption would be that internet expansion is correlated with improved educational outcomes. The existing literature on this topic does not find this to be the case. In our setting, we find the same. However, when we disaggregate educational outcomes of students by achievement, we find that outcomes of the lowest performing students actually do improve.

This work underscores the importance of not just interrogating popular beliefs and assumptions, but also common findings in the literature.

Underpinning my research is a desire to contribute to a comprehensive welfare analysis of public investments. I seek out settings with intuitive assumptions about how a policy will impact its target population in all of my research. There are few things more satisfying than interrogating those assumptions with high-quality data and economic models. Across various large-scale investments and subsidy programs, I find behavioral responses induced by those policies that may lead to unintended consequences that sometimes mitigate the intended effects. I am eager to continue this line of inquiry in future projects. Should everyone be a homeowner? We need green energy, but what are the costs to transport that energy to cities? Do highway expansions increase access to cities and what are the social costs? I have the drive, motivation, passion, and intellectual curiosity to continue this research agenda and I believe being an Assistant Professor at your department would be the ideal intellectual home to pursue this work.

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