



BROWN

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## Research Statement,

My professional mission is to contribute to the public welfare by providing rigorous empirical evidence and tools to design effective public policy. 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 obsessed with testing 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 estimate the cost of building and maintaining the IHS. We find a cost increase for new construction and resurfacing the existing highways. Compared to 1993, in 2008, building new lane miles is five times more expensive and resurfacing existing lines is two times more expensive. We can explain the increase in resurfacing cost and reject that pavement durability, institutional and regulatory environment, or input prices explain the rise in costs of building new lines. We find suggestive evidence that factors associated with how lines are built can explain the cost increase. 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, it 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 better 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 in both developed and developing countries. Governments implement different policy interventions, but we know little about their effectiveness. Evaluating housing policy has several empirical and theoretical challenges. I found an ideal setting in the Colombian housing policy to address those challenges and empirically evaluate the housing market response to a price-capped policy intended to promote housing to low-income families.

Several particular features allowed me to overcome the main empirical challenge of separating supply and demand responses and of finding a valid counterfactual:

1. A price cutoff defines subsidy eligibility.

2. Both developers and households receive subsidies or tax incentives.
3. A massive subsidy expansion during the last decade.
4. Unique data containing the universe of new construction projects and administrative records from the Minister of Housing.

I use the cutoff to study the behavioural responses induced by the policy. There is 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 went from 1 percent to 7 percent of the market. I use techniques used in the bunching literature to estimate a counterfactual distribution—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 defining 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 define a marginal buncher household and a marginal buncher developer. They are indifferent between not receiving the subsidy and changing the type of housing they buy and build to qualify for it. I use this condition and the estimated behavioural effects to estimate the parameters describing the cost and utility functions of the model. The estimates of the behavioural responses allow me to observe two points in the indifference curves of developers and households. Then, I have two equations with two unknowns, and the solutions correspond to the structural parameters of interest. 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 found that the benefits to average households changing the housing type to benefit from the subsidy did not increase during my study period despite the increase in the subsidy side. On the developer side, removing the tax incentives could generate a provisioning problem, particularly by the end of my study period. Developers would have a 14 percent decrease in their profits, potentially 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. Using location as a targeting tool to implement redistributive policies affects the relative attractiveness of different locations, potentially affecting the housing market. Using a Regression Discontinuity Design, I find that the difference in subsidy levels across places induces new construction in highly subsidized areas. As predicted by the theory, housing prices are higher in heavily subsidized areas. This research is important because it provides rigorous empirical evidence to support the urban economist mantra *subsidize people, not places*. Evidence like the one provided in this paper is required to inform the renewed interest in using location as a targeting tool to implement redistributive policies. It also shows how accounting for potential unintended consequences is important when evaluating the potential effects of a policy.

In other papers, I studied the expansion of the higher education system in Colombia and the effects of expanding the internet network on education outcomes. In these papers, my coauthors and I combine the universe of standardized test costs 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 programs have 16 percent lower wages than students graduating from existing programs. However, we find that the observable characteristics almost entirely explain this unconditional wage difference. New programs are created in areas of study with lower returns and attract worse students. These findings challenge the assumption that increasing higher education will automatically reduce inequality.

In Uribe and Weisborg 2021, we use variation over time and an instrumental variable approach exploiting the costliness of extending the existing internet infrastructure to connect new areas to identify the causal impacts of internet access on test scores. We find that increasing internet access affects math test scores, particularly at the bottom third of the test score distribution. Internet is one of the most important tools in our modern economy. A relevant share of the world population remains unconnected, and in many cases, policy interventions are necessary to provide access. Therefore, it is crucial to quantify the impacts of increasing internet access on education outcomes and present the beneficial effects of these government-led expansion policies.

The intuitive reflex will be that internet expansion improves scores across the board - however, other papers have found that they have no effect. Our paper shows that when disaggregating the data internet has a positive impact on the lowest performers. This careful analysis has implications for how we prioritize internet expansion.

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 or 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?

I have the drive, motivation, passion, and intellectual curiosity required to pursue a research career. Being at would be the ideal intellectual home to pursue this work.

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