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The political economy of transportation investment

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ABSTRACT

Will politics lead to over-building or under-building of transportation projects? In this paper, we develop a model of infrastructure policy in which politicians overdo things that have hidden costs and underperform tasks whose costs voters readily perceive. Consequently, national funding of transportation leads to overspending, since voters more readily perceive the upside of new projects than the future taxes that will be paid for distant highways. Yet when local voters are well-informed, the highly salient nuisances of local construction, including land taking and noise, lead to under-building. This framework explains the decline of urban mega-projects in the US (Altshuler and Luberoff, 2003) as the result of increasingly educated and organized urban voters. Our framework also predicts more per capita transportation spending in low-density and less educated areas, which seems to be empirically correct.

1. Introduction

Should we expect democratic governments to provide the socially optimal level of transportation infrastructure, or will the democratic process lead to either over- or underinvestment? Like all public actions, transportation decisions will be shaped not only by voter preferences but also by voter attention. Costs that are obvious, like the inconvenience of a freeway to neighbors, will carry more weight than costs that are hidden, like the budgetary costs of federal transfers for future generations. Groups that are better informed and more politically active will receive more benefits than the ill informed and the inactive.

The power of attention can explain why parties don't converge on the preferred policies of the median voter. If different parties communicate disproportionately with different groups, such as labor unions and churches, then they will skew their policies to please the voters who are listening more to their messages (Glaeser et al., 2005). If the workers in protected industries pay more attention to tariff policy than consumers, then protectionism will become attractive politics (Ponzetto, 2011). If the value of future pension and health care benefits are more salient to municipal workers than their costs are to voters, then public workers will be paid disproportionately in such shrouded forms of compensation

(Glaeser and Ponzetto, 2014).

In this paper, we apply the logic of political attention to transportation investment. In Section II, we begin by discussing the arc of investment described Altshuler and Luberoff (2003). Their definitive study of post-war American mega-projects describes three periods. Initially, US cities, supported with federal subsidies, build mega-projects and largely ignore the downsides of this building to local residents. In the second period, local opposition, such as the Freeway Revolts, blocks many of these projects. In the third period, mega-projects reappear, but they are even more expensive because builders take great care to avoid harming local residents.

While this arc is overly simplistic, it suggests that America may have gone from a period of overbuilding to a period of underbuilding and perhaps over-abatement of the downsides of construction. Our model is meant to explain this transition and yield other testable implications about infrastructure investment. We highlight two ways in which voter attention skews transportation spending: spending elsewhere is not salient while local nuisances are extremely salient.

The first distortion assumes that while voters can easily see the benefits of a new highway, they don't pay much attention to the marginal dollar added to the federal budget. Consequently, when the federal

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government starts funding infrastructure, the incentive to spend becomes stronger even when spending decisions are made at the national level. Our attention model yields a microfounded version of Weingast's (1979) "Law of 1/N" in which spending proceeds as if benefits are weighed only against each jurisdiction's share of total costs. This force will lead to too much spending, and may perhaps explain why America experienced so much investment during the early postwar period.

The second distortion is that the physical downsides of construction are even more salient to the neighbors of new infrastructure than the benefits of that infrastructure are to its users. Those physical downsides include noise, pollution and the use of eminent domain to acquire land. The salience of these costs is well illustrated by the popular fury that erupted in the Freeway Revolts and by the ardent opposition to private and public construction that exists in many parts of the US today.

This second force can lead to underprovision of transportation infrastructure and explain why the era of big building yielded to an era of infrastructure caution. As urban residents became better educated and better organized, the salience of these local costs became more important to electoral politics. The salience of these costs to educated voters is one explanation of the rise of "Not in My Back Yard" -ism or NIMBYism. The model also predicts that once the harmed are sufficiently well informed, infrastructure investment will decline with their income levels.

Our model shows that a perfectly calibrated federal funding strategy can exactly offset the salience of local costs and yield the socially optimal level of transportation investment. The ideal share of federal spending rises with the knowledge mismatch between the local winners and losers from transportation investment. The optimal federal subsidy also rises with the nuisance costs of construction and the benefits of transportation to users, assuming that the urbanites who suffer the costs are better informed.

Yet we suspect that this optimistic scenario is unlikely to reflect reality, especially because a national funding policy cannot be well tailored to local conditions. A funding strategy that yields optimal infrastructure in dense and well-educated San Francisco is likely to be far too generous to yield optimal infrastructure investment in less dense and more poorly educated parts of America. Our model predicts that holding the federal spending share constant, we should see more per capita investment in low density areas and less investment in higher density areas.

We then include abatement investment to capture Altshuler and Luberoff's (2003) third era of mega-projects. Abatement investments reduce the costs of infrastructure to local residents, and one example might be routing the infrastructure so that it avoids any dense neighborhoods and any use of eminent domain. Once we allow abatement investment, then a single federal funding share cannot yield an efficient level of abatement and an efficient level of investment. If knowledge is particularly high among those harmed by infrastructure, then this will require a generous federal funding share, but that will also produce an excess of abatement investment. This logic suggests that third era projects, like Boston's Big Dig, may have spent too much on abating local nuisances.

We focus on spending decisions that are determined at the national level, but we also consider the impact of local control over spending. Typically, local control and financing will lead to underinvestment, because local voters don't consider the benefits to outsiders. When localities receive a federal subsidy share of costs, then the optimal subsidy can be either smaller or larger than with national decision-making, because while local voters don't consider the tax implications to outsiders, they also don't consider the infrastructure benefits to outsiders.

User fee financing will also impact investment because of its salience. When user fees are more salient than taxes, then user fee financing will tend to reduce investment. When federal funding cannot achieve the first best on its own, then user fees can be used to fine tune the investment.

In Section VIII, we briefly discuss added implications of our model. We predict that there will be more spending in low-density areas than in high-density areas, because salient nuisances from construction are more common in denser areas. Recent within-state spending patterns strongly support this implication.

We also predict that highways will be sited in less education areas,

since less educated people are typically less politically aware and less politically active (Galston, 2001). A robust literature shows that less educated people are more likely to live near highways. Yet that pattern also reflects post-construction geographic mobility. Brinkman and Lin (2016) is the one paper we know that seems to show that highways are built in less successful neighborhoods.

Our model also predicts that spending on abatement will be more common in more educated areas. We lack direct data on abatement spending. However, there is a strong pattern that better educated states have larger highway disbursements per mile. One interpretation of this fact is that these states are spending more to reduce the downsides of highways, but that is more of a hypothesis than a fact.

Finally our model predicts that national control will lead to more spending in places that receive more outside visitors. A comparison of the US and the UK appears to support this fact, since US transportation spending skews towards lower density states, while UK spending skews towards London, which receives millions of visitors from elsewhere in the UK. We hope that future work will provide more serious tests of our model.

This paper highlights two offsetting ways in which politics distorts transportation spending. The national funding of local projects ensures too little attention to the financial costs of those projects. The highly salient nature of local nuisances ensures that too much weight will be given to those nuisances. In an ideal world, these two political failures balance each other out, but we doubt that they do in reality.

Our paper follows a growing theoretical literature on the connection between voter knowledge and political outcomes. Coate and Morris (1995) pioneered this literature, showing that politicians will transfer in opaque and inefficient ways to reduce punishment by voters. Gavazza and Lizzeri (2009) show that limited transparency can shape the flow of transfers and increase debt levels. Glaeser and Ponzetto (2014) similarly show how limited observability leads to excessive use of shrouded forms of compensation for government employees, such as pensions and health care. Boffa, Piolatto and Ponzetto (2016) explore how voter information shapes the optimal federal structure of government, which relates to our investigation of the impact of federal funding on transportation projects.

Our paper also follows a small but distinguished literature on the political economy of transportation. Knight (2005) shows that constituencies whose US representatives belong to the House Committee on Transportation and Infrastructure receive more infrastructure spending. Brueckner and Selod (2006) show that heterogeneity within a city can lead to underinvestment in transportation. De Borger and Proost (2016a) examine the federal role in transportation spending, and find that in the absence of institutional constraints, local decision-making outperforms national decision-making when the majority of voters use the infrastructure. De Borger and Proost (2016b) find that the presence of institutional constraints, such as uniform road pricing, may lead federal decision-making to outperform local decision making.

2. The rise and decline of megaprojects

Between 1926 and 1939, America built six suspension bridges with central spans that exceeded 500 m, and four of these were, at the time, the longest in the world. Since 1964, we have built only two such bridges. While the earlier bridges were often in the heart of great metropolitan areas, the two more recent bridges were in far less dense settings. American construction of long tunnels and urban highway miles has also slowed dramatically relative to the post-war heyday of construction.

Altshuler and Luberoff's (2003) *Mega-Projects* provides the definitive history of America's twentieth-century urban infrastructure building. They describe three distinct phases. In the first phase, which largely ran until the early 1960s, building proceeded with federal support and little concern over local opposition. During that period, massive projects, including New York's Lincoln Center, Chicago's Dan Ryan Expressway, and San Francisco's Golden Gate Bridge, were constructed in the heart of metropolitan areas.

During the second phase, community opposition coalesced, with early

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