

Joshua Semat*, David Lowery, Suzanne Linn, and William D. Berry

Baumol's cost disease and the withering of the state

Abstract: Most theories of government growth place nearly exclusive attention on real changes in public sector activity. Yet, much nominal post–WWII government spending growth was not in the form of the public sector doing more relative to the general economy (real growth), but in the form of government activities becoming relatively more expensive (cost growth). Baumol's (1967) "cost disease" model is our best guide to understanding cost growth, but over time, Baumol has offered conflicting hypotheses about how cost growth bears on real growth. Using 1947–2012 U.S. data, we test these hypotheses, along with a more novel expectation, by modifying Berry and Lowery's (1987b) econometric models of real growth in public purchases and transfers to consider the influence of government cost growth on real public domestic spending.

Keywords: cost disease, public sector, fiscal policy, cost growth, transfer spending

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Since¹ the Reagan Administration of the 1980s, policy debates in Washington have been broadly framed in terms of the appropriate share of economic activity devoted to the public sector. As Ezra Klein put it, "American politics is one long argument about what government should or shouldn't be doing, and how it should or shouldn't be doing it."² Those on the left generally call for an expansion of the government's share of the economic pie, while those on the right search for ways to strangle what they view as an emerging Leviathan. Economists and political scientists have engaged in this contentious discussion even longer, ranging

1 Replication materials are available by request from the authors.

2 *The Washington Post* 16 July 2015, "The U.S. Government: An Insurance Conglomerate Protected by a Large, Standing Army," Ezra Klein, http://voices.washingtonpost.com/ezra-klein/2011/02/the_us_government_an_insurance.html.

***Corresponding author: Joshua Semat**, PhD student, Political Science, 203 Pond Lab, Pennsylvania State University, University Park, PA 16802; Email: sematjk@gmail.com

David Lowery, Professor of Political Science, 203 Pond Lab, Pennsylvania State University, University Park, PA 16802

Suzanna Linn, Professor of Political Science, 203 Pond Lab, Pennsylvania State University, University Park, PA 16802

William D. Berry, Professor of Political Science, 203 Pond Lab, Pennsylvania State University, University Park, PA 16802

from Anthony Downs asking if the government is inevitably too small in democracies to James Buchanan³ asserting nearly the opposite.⁴ The result is that a variety of explanations for the growth of a government—ranging from “Wagner’s Law” to the role of interest organizations in promoting expansive government⁵—have been developed and tested. Indeed, a comparison of two studies of government growth separated by a quarter-century—Lowery and Berry and Garrett and Rhine — suggests that our stock of theory about the growth of government has changed little over the last several decades.⁶

Yet, most of these theoretical accounts—as well as the empirical analyses designed to test them—may be seriously misplaced due to their almost exclusive attention to real as opposed to nominal changes in the scale of public sector activity relative to the size of the economy as a whole. That is, most of the hypothesized explanations for government growth seek to explain why governments provides *more* goods and services.⁷ But much of the nominal growth of U.S. government spending from the end of World War II to the mid-1970s—from two thirds to three quarters⁸—was not in the form of the public sector doing more relative to the size of the economy as a whole (i.e., *real* growth in government), but was instead in the form of the things a government does becoming more expensive than activities in the private sector (i.e., government *cost* growth).⁹ And this pattern did not change after the 1970s, despite many changes in the nature of economic production in the public and private sectors.¹⁰

Baumol’s work plays an important role in understanding government cost growth.¹¹ Baumol’s theory accounting for government cost growth assumes that the economy is composed of two sectors—one relatively more capital intensive and the other relatively more labor intensive. The former tends to have rapid

3 Buchanan (1977).

4 Downs (1960).

5 Tarschys (1975); Borcherding (1985); Cameron (1978); Wagner (1976); Larkey, Stolp, and Winer (1981); Lowery and Berry (1983); Lewis-Beck and Rice (1985); Garand (1988); Garrett and Rhine (2006); Lybeck and Henrekson (2014).

6 Lowery and Berry (1983); Garrett and Rhine (2006).

7 We consider these substantive explanations below when constructing our tests of the consequences of cost disease for the share of the economy devoted to the public sector. Importantly however, empirically testing these explanations for *real* government growth requires carefully deflating government spending values so as to account for cost growth (Berry and Lowery (1984)).

8 Beck (1976); Berry and Lowery (1987a).

9 This is not meant to deny that ever more expensive government is itself a problem. But it is a different problem than the one addressed in conservative criticism of “big government” (Heller 1981).

10 Semat, et al. (2015).

11 Baumol’s (1967; 1993; 2012); see also Baumol, Blackman, and Wolff (1985); Beck (1976).

increases in productivity via capital improvements, while the latter has few productivity gains. The increases in productivity in the capital-intensive sector support wage increases. Then, to avoid a flow of labor from the labor-intensive sector to the capital-intensive sector as employees seek higher wages, the labor-intensive sector must also increase wages. The result is ever-increasing costs in the labor-intensive sector even if the quality and quantity of goods and services in this sector remain constant. If, as Beck and Baumol suggest, the public sector is more labor-intensive and the private sector is more capital-intensive, then the cost of goods and service in the public sector will increase over time relative to costs in the private sector.¹²

A large and growing body of work supports Baumol's explanation for government cost growth.¹³ Indeed, based on a survey of the literature, Nordhaus concludes that, "Baumol's hypothesis of a cost-price disease due to slow productivity growth is definitively confirmed by the data."¹⁴ As productivity increases in the more capital intensive private sector, wages increase. As private sector wages increase, labor competition between the public and private sectors leads to corresponding wage increases in the more labor-intensive public sector. The latter, however, are funded through higher taxes rather than via increased productivity. The result is that the costs of government for a constant market basket of goods and services tend to increase over time relative to costs in the private sector — "Baumol's disease."

Our paper has two objectives. Our primary purpose is to assess what secondary impact, if any, government cost growth has had on the real size of a government. Baumol himself, at different times during his long career, has made contrary predictions in this regard. Baumol predicts that cost growth will lead to an inevitable decline in governments' real share of economic activity.¹⁵ Faced with rising costs for public sector goods and services, consumer-voters will shift spending from the former to the latter. In contrast, an older Baumol believes

12 There is considerable evidence that the public sector tends to be more labor intensive and less capital intensive than the private sector (Bradford, Malt, and Oates (1969); Spann (1977a; 1977b); Borcherdig (1977)), although this evidence has at times been contested (Buchanan and Tullock (1977), 285-7.

13 (Neck and Getzner (2007); Berry and Lowery (1984); Bates and Santerre (2013a; 2013b; 2015); Hardwig (2008); Colombier (2010); Semat, et al. (2015).

14 Nordhaus (2006), 21. A competing explanation for growth in the cost of government is the Bureau Voting hypothesis (Buchanan and Tullock (1977)), which attributes cost growth to an increase in voting power of government employees. But Berry and Lowery (1984) and Semat et al. (2015) find no empirical evidence for this explanation.

15 Baumol (1967).

that government cost growth should not limit the real size of the public sector.¹⁶ That is, because of productivity improvements in the private sector, we will be able to afford paying more for a constant level of public goods and services. We assess the empirical veracity of these differing assessments of the implications of government cost growth—as well as two alternative expectations that cost growth has different implications for the scope of government purchases than for the real amount of government transfers. Our empirical analysis modifies Berry and Lowery's econometric models of the real growth of public purchases and transfers to assess the veracity of three possible effects of the growing cost of government goods and services relative to costs in the overall economy—a concept that we abbreviate as “government's relative cost.”¹⁷ We argue that Berry and Lowery's models are especially well suited for this analysis because, unlike all of the other extant empirical models of government growth cited earlier, Berry and Lowery's models disaggregate total government spending into government purchases and transfer payments, categories of spending the real level of which may be quite differently influenced by the government's relative cost. A secondary purpose of our paper, albeit largely in notes, is to reassess Berry and Lowery's original findings about the economic and political factors influencing the real size of a government by replicating the estimation of their models—taking advantage of both twenty-five years of additional longitudinal data and the many improvements in time-series analysis.

In the next section, we develop alternative hypotheses about the effect of the cost of government goods and services relative to costs in the overall economy on the real size of a government, deriving these propositions from predictions made by Baumol over the course of his long career. Then we review Berry and Lowery's econometric models, before modifying them to permit tests of our competing hypotheses. We present our empirical findings and conclude by discussing whether the younger or older Baumol had it more nearly right when considering the impact of cost disease on the size of government.

Baumol's disease and the real growth of government

As noted above, Baumol has been inconsistent in his expectations about whether and how the cost of government goods and services relative to costs in the overall economy should influence real spending. In some of his analyses of the cost

¹⁶ Ibid. (2012).

¹⁷ Berry and Lowery's (1987b).

disease, he suggests that as the real costs of public sector goods and services increase, consumer/voters should, *at least in some cases*, prefer to substitute private sector goods and services for those produced in the public sector, leading to a decline in the level of government services, and thus a decrease in the share of real economic activity devoted to the public sector.¹⁸ Whether such substitution occurs depends, of course, on the price elasticity of public goods and services. Baumol, for example, cites higher education as a public service that is relatively price inelastic, noting that, “as productivity in the remainder of the economy continues to increase, costs of running the educational organizations will mount correspondingly.”¹⁹ He also notes that “not all services in the relatively constant productivity sector of the economy face inelastic demand. Many of them are more readily dispensable ... as far as individual consumers are concerned. As their costs increase, their utilization tends therefore to decrease into the category of luxury goods with limited markets or disappear almost completely.”²⁰ In such cases, reduced demand for price elastic goods and services could lead to sharp reductions in spending relative to the overall size of the economy. Thus, Baumol notes that, “spending on these services is apt to be cut back or, at best, increased by amounts that are barely sufficient to stay abreast of overall inflation.”²¹ As a result, the supply of these services may fall in both quality and quantity.” In assessing the severity of this consequence of the cost disease, however, it seems reasonable to assume that public goods and services are not uniformly price elastic or inelastic. Rather, they represent a range of elasticities. Thus, Baumol’s disease should lead to downward pressure on the demand for public goods and services in general even if it is uneven across different types of goods and services.

Baumol also notes, however, that such downward pressure on demand could well be much more pervasive than warranted by variations in price elasticities, *per se*, if *politicians and citizens misunderstand the full implications of Baumol’s disease*. This is, in a sense, a political rather than an exclusively economic interpretation of Baumol’s analysis. On this critical point Baumol observed that:

The critical point here is that because politicians do not understand the mechanism and nature of the cost disease, and because they face political pressures from a similarly uninformed electorate, they do not realize that we can indeed afford these services without forcing society to undergo unnecessary cuts, restrictions, and other forms of deprivation.²²

18 Baumol (1967), 424–26.

19 *Ibid.*, 420–21.

20 *Ibid.* 421.

21 *Ibid.* (2012), 27.

22 *Ibid.*, 62.

We discuss the foundation of this political version of Baumol's disease more fully below. But, whether due to well founded economic choices concerning the proportion of public goods and services that are indeed price elastic and/or a political failure on the part of elected officials and their constituents to appreciate how the cost disease operates, real public spending as a proportion of economic activity might well decline over time. This reasoning prompts the following proposition:

Withering State Proposition: As the cost of government goods and services relative to costs in the overall economy (i.e., government's relative cost) increases, the real size of government declines.

In more recent work, however, Baumol contends that government cost growth should have little impact on real public sector spending.²³ This prediction is based on an expectation that productivity improvements in the capital intensive sector of the economy (the private sector in Baumol's stylized two-sector economy) make the country wealthier over time so that the public sector (the labor intensive sector in Baumol's model) can afford to spend more for a static level of real goods and services. Thus, Baumol notes that, "Despite ever increasing costs, [public] sector services still never become unaffordable to society. This is because the economy's constantly growing productivity simultaneously increases the community's overall purchasing power and makes for ever improving living standards."²⁴ Indeed, Baumol anticipates that the government's share of gross domestic product (GDP) will rise to 60 percent over the next century with no change in real levels of public sector goods and services.²⁵ In making this prediction, Baumol is assuming that politicians and citizens can be fully informed about the true implications of the cost disease, an assumption that he acknowledges is fraught with difficulties.²⁶ Nevertheless, Baumol's more recent work is quite optimistic—at least on the economics if not the politics of the cost disease—and suggests the following expectation:

Surviving State Proposition: As the cost of government goods and services relative to costs in the overall economy (i.e., government's relative cost) increases, the real size of government should remain unchanged.

Yet, as noted above, there are reasons to believe that the Surviving State Hypothesis may be wrong. This returns us to the political implications of Baumol's disease. First, it views consumers as both rational and fully informed, so as to be aware of changing relative costs in the public and private sectors and

²³ Ibid.

²⁴ Ibid., xx.

²⁵ Ibid., 63.

²⁶ Ibid.

the changing values of their income, and thus be able to avoid thinking exclusively about the size of government in nominal terms. However, there is considerable evidence that consumers, even when making routine consumption choices, both may not be fully aware of changing relative prices in many contexts²⁷ and are often susceptible to what Shafir, Diamond, and Tversky call a “money illusion” whereby they are attentive only to nominal costs.²⁸ This is not surprising; government goods and services—because of both the inherent separation of the decisions to spend and tax, and the collective nature of public sector fiscal choices—impose additional conceptual burdens on citizens’ capacities to think about marginal costs, burdens that may potentially result in a money illusion in the same manner in which they contribute to fiscal illusions.²⁹ Indeed, Baumol asserts that the quantities of many public services have already been unnecessarily cut in response to cost disease problems,³⁰ and recognizes that citizens and political elites may well be susceptible to a money illusion.³¹

Second, the assumption that as the United States becomes wealthier it can afford to spend more on public goods and services may overlook a reluctance by all or even most voters to support devoting more of their wealth to the public sector. Inequality of incomes has grown in recent decades because most income gains have accrued to only the extremely wealthy.³² Consequently, it is not at all clear that most voters will feel that they have the capacity to finance even a constant level of government goods and services at ever higher levels of taxes even if overall income is up. Thus, the Withering State Proposition—that government cost growth prompts a decrease in the share of real economic activity devoted to the public sector—remains plausible even if Baumol is correct in arguing recently that, at least at the societal level, “we can afford it all.”

More intriguingly, the possibilities for how cost disease bears on the size of the public sector may be more nuanced than the two competing hypotheses advanced by Baumol. Simply put, Baumol lumps almost all government activities together into the low-productivity sector of the economy.³³ This is certainly reasonable for *domestic purchases* by the public sector—e.g., services provided by teachers, prison guards, and police officers. But Baumol treats government *transfers* in the same manner. He writes, “Government welfare and related programs, which do

²⁷ Estelami, Lehmann, and Holden (2001).

²⁸ Shafir, Diamond, and Tversky (1997).

²⁹ Wagner (1976); Lowery (1987).

³⁰ Baumol (2012), 63.

³¹ *Ibid.*, 62.

³² Piketty (2014).

³³ Baumol (2012), 26–7.

not benefit from any significant source of productivity growth, are essentially handicraft activities whose technology remains fundamentally unchanged.”³⁴ This is, of course, correct with regard to spending to *purchase* the labor of public welfare officers who *process* transfer payments. But the bulk of transfer spending is not used to purchase such services. Rather, it is simply extracted from the private sector via taxes and returned to individuals to be spent in the private economy. *Thus, actual transfers—public sector spending provided citizens for their own consumption—are not subject to the pitfalls of cost disease over and above how they bear on the economy on average since they are spent in that larger economy.*

More to the point, government purchases and transfers may be, to some degree, substitutable. As discussed below, such substitution may be direct or indirect. But if this expectation is true, then the product substitutions that Baumol anticipates result from cost disease may not be from the public to the private sector, but instead entail government spending shifting from domestic purchases to transfers, thereby prompting an increase in the real level of transfers.³⁵ Importantly, this perspective is not inconsistent with Baumol’s analysis. Indeed, Baumol discusses “hybrid industries” that rely on inputs from both productivity progressive and stagnant production processes.³⁶

Such substitution may come in two forms. The first and most obvious is a direct substitution of one provision mechanism for another. We noted above that transfers and purchases are in part substitutable. This is certainly true in many cases, such as the example of Veterans Hospital and Medicaid that we earlier cited. But in many other cases, such as the services provided by agencies like NASA or the Department of Justice—or simply building roads—this is doubtful. It is not at all clear what a substitutable transfer would entail in these cases. Thus, cost disease pressures are likely to continue to bear on many of the activities supported by domestic purchases, leading to either of our previous two propositions. But to the extent that some public goods and services are directly substitutable, we should see more reliance on transfers and less on direct production as Baumol’s disease influences production choices.

34 Ibid., 27.

35 Baumol (2012). For example, the British National Health Service and U.S. Veterans Hospitals entail substantial direct purchases of labor while Medicare and the expansion of Medicaid as part of the Affordable Care Act rely on transfers to achieve the same general objectives.

36 Ibid., 111–15. He cites the example of television production, which relies both on research and development spending, which is stagnant in its production technologies, and the manufacturing of televisions, which is technologically progressive. In such hybrid industries, one might expect a real decline over time in research and development as their costs escalate relative to the overall price of televisions.

Second, Baumol's disease may create incentives for a much more indirect type of substitution of transfers for direct production among entrepreneurial politicians. That is, elected officials need problems to solve for their constituents.³⁷ That is how they get reelected. In doing so, they are politically rewarded for spending and politically punished for taxing. Given the dilemma posed by this incentive system, Baumol's disease could alter the political calculus of deciding to address issues with transfer solutions or issues with solutions entailing direct government production of goods and services. It would do so by generating more "bang for the buck" over time from the former than the latter since the former is less influenced by Baumol's disease than the latter. Thus, political agendas may change due to Baumol's disease in such a way that transfers become a more prominent form of government spending. Given these two mechanisms, we can advance a third proposition involving both purchases and transfers, whereby cost pressures on the purchases or direct production side of the government budget ledger lead to its shrinking as spending is shifted to the transfers-side of the ledger.

Withering Purchases/Prospering Transfers Proposition: As the cost of government goods and services relative to costs in the overall economy (i.e., government's relative cost) increases, (i) the real level of government purchases declines, and (ii) the real level of government transfers increases.

The direct substitution of transfers for purchases may be only partial, however. It is also possible that there are real pressures on governments to grow in real terms even if the Surviving State Hypothesis of Baumol's later work is largely valid. Government's real share of economic activity need not remain constant. But even in the case of real government growth in such a surviving state condition in which Baumol's Cost Disease prevails, the cost of government purchases will increase relative to those of transfers. This could well create bias among public officials to rely on transfers to address pressures for new real growth rather than on real purchases spending. This leads to the following proposition.

Surviving Purchases/Prospering Transfers Proposition: As the cost of government goods and services relative to costs in the overall economy (i.e., government's relative cost) increases, (i) the real level of government purchases remains stagnant, and (ii) the real level of government transfers increases.

Designing an empirical test

We seek to test the propositions presented in the previous section about the effect of a government's relative cost on the real size of a government. An

³⁷ Schneider, Teske, and Mintrom (1995); Mintrom (2000).

appropriate test is complicated by the existence of many alternative explanations for government growth. Put simply, a suitable empirical test must control for many variables that have been predicted to influence the real size of government. Our approach is to modify econometric models developed by Berry and Lowery—which include independent variables reflecting a variety of extant explanations for government growth—by incorporating a government’s relative cost as an additional independent variable.³⁸

Berry and Lowery’s models have several advantages over the other econometric models discussed and cited in the introduction.³⁹ The first concerns the dependent variable. Most empirical models of government growth have as dependent variables a measure of the total *nominal* size of a government. In contrast, Berry and Lowery’s models use deflated indicators of the *real* size of a government as dependent variables, which is consistent with testing our propositions that pertain to the effect of government’s relative cost on the *real* size of a government (or the real level of transfers or purchases).⁴⁰ Further, almost all prior empirical analyses of government growth employ government’s total share of the economic pie as dependent variables. In contrast, Berry and Lowery disaggregate government spending into purchases and transfers, and develop separate models for each category. Their dependent variables are the real level of government spending on domestic purchases or on transfers, respectively, as a proportion of GDP. To be able to test our propositions, then, we too must employ disaggregated dependent variables. Thus, Berry and Lowery’s models suggest that the dependent variables in our propositions should be the domestic purchases share of GDP in year t to (*PURCHASES*)⁴¹ and the transfers share of GDP in year t (*TRANSFERS*).⁴²

Turning to the independent variables, Berry and Lowery address pervasive multicollinearity by estimating separate models reflecting each of two, broad, accounts of the forces shaping government growth in the United States.⁴³ Their *excessive government* models (of both government transfers and purchases) suggest that forces within a government drive public sector growth, while their *responsive government* models (of both government transfers and purchases) assume that government growth arises from external pressures. The fact that

38 Berry and Lowery (1987b).

39 Ibid.

40 Ibid.

41 Or, the ratio of federal, state/local government purchases of goods and services for other than defense (deflated by the implicit price deflator [IPD] for non-defense purchases) to GDP (deflated by the IPD for GDP).

42 Or, the ratio of federal, state and local expenditures for transfers programs (deflated by the IPD for personal consumption expenditures) to GDP (deflated by the IPD for GDP).

43 Berry and Lowery (1987b).

Berry and Lowery specify and test “responsive” and “excessive” versions of each of their models (for both transfers and purchases) is important for us, since modifying their models by adding a government’s relative cost as an independent variable allows us to determine whether our empirical results about the effect of a government’s relative cost are robust to two quite different sets of control variables.

Berry and Lowery test several extant theories of government growth with four models.⁴⁴ Since detailed rationales for the selection of variables and their operational definitions can be found in Berry and Lowery’s published paper, we offer only capsulated descriptions here.⁴⁵ The first, the *responsive government model of domestic purchases* contains variables reflecting two explanations of government growth. The first is Wagner’s Law.⁴⁶ The core of Wagner’s Law is the supposition that government spending is income elastic; as income increases, the demand for government spending increases even faster given that many of the amenities sought as a population becomes wealthier tend to be public goods such as clean air and good roads.⁴⁷ Another part of Wagner’s interpretation concerns societal interdependencies that may demand public goods solutions in the form of domestic purchases.⁴⁸ In particular, the formation of new households in the population requires public spending on infrastructure,⁴⁹ and an increase in the population that is young requires spending on schools and then prisons,⁵⁰ all of which lead to increases in public purchases relative to the size of the economy as a whole. The second explanation captured in this model concerns the political party controlling the government in question.⁵¹ When electorates choose Democrats, this can be viewed as demand for greater levels of domestic purchases.⁵² In contrast, the election of Republicans indicates a demand for lower spending.⁵³ Thus, Berry

⁴⁴ Berry and Lowery (1987a).

⁴⁵ Ibid. (1987b).

⁴⁶ Wagner’s Law (1877); see also Wagner and Weber (1977).

⁴⁷ The model includes *INCOME* (measured by annual total personal income in constant dollars).

⁴⁸ Wagner (1877) also highlighted industrialization in discussing societal interdependencies. However, this seems less relevant in the case of the post-World War II United States.

⁴⁹ The model includes *HOUSEHOLD* (measured by the total number of U.S. households).

⁵⁰ The model includes *YOUNG* (measured by the proportion of the population under the age of eighteen).

⁵¹ Blais, Blake, and Dion (1993).

⁵² Lewis-Beck and Rice (1985).

⁵³ Buchanan and Tullock (1977). The model includes *PARTY* (as measured by an index ranging from 0 to 1—where 1 indicates Democratic Party control of the White House, the Senate, the House, and state governorships with the House, Senate, and Governorships values based on shares of seats and weighted the same as control of the White House).

and Lowery's responsive government model of domestic purchases is specified in the following equation.⁵⁴

$$(1) \quad \begin{aligned} PURCHASES_t = & b_0 + b_1 INCOME_{t-1} + b_2 HOUSEHOLD_{t-1}, \\ & + B_3 YOUNG_{t-1} + b_4 PARTY_{t-1} \end{aligned}$$

The second model, the *excessive government model of domestic purchases*, highlights forces internal to governments, especially the roles of self-interested bureaucrats and elected politicians. This model assumes that government employees tend to vote as a block for candidates supporting a larger public sector. Therefore, as public employees become a larger share of the electorate, more such candidates win office and—when elected—reward their supporters with an expansion of government.⁵⁵ This model also reflects the efforts of elected officials to expand purchases while avoiding the resulting blame by adopting fiscally illusionary tax systems. Systems that are highly illusionary rely heavily on withholding,⁵⁶ debt financing,⁵⁷ and a complex array of taxes,⁵⁸ thereby leading voters to think that they are receiving such good value for their money that they will demand ever more government purchases.⁵⁹ Finally, the model reflects competing hypotheses developed by Cameron and Marlow;⁶⁰ Cameron suggests that more centralized fiscal systems, as manipulated by self-serving politicians, are better able to restrain purchases, while Marlow postulates nearly the opposite.⁶¹ The excessive government model of domestic purchases, then, is as follows.

⁵⁴ Berry and Lowery's (1987b).

⁵⁵ The model includes *CIVGOVEM* (as measured by the number of civilian government employees as a percentage of the voting age population).

⁵⁶ Wagstaff (1965).

⁵⁷ Buchanan and Wagner (1977).

⁵⁸ Craig and Heins (1980).

⁵⁹ Goetz (1977); Pommerehne and Schneider (1978). The model includes *WHELD*, *DEBT* and *COMPLEXITY* (as measured, respectively, by the proportion of taxes that are collected via withholding; the ratio of government debt to expenditures, and a Herfindahl index of revenue concentration).

⁶⁰ Cameron (1978); Marlow (1988).

⁶¹ The model includes *REVCEN* and *AID* (as measured, respectively, by (i) federal government receipts as a proportion of total federal, state, and local receipts, excluding grants-in-aid, and (ii) federal and state grants-in-aid to state and/or local governments as a proportion of total federal, state, and local expenditures).

$$(2) \quad PURCHASES_t = b_0 + b_1 CIVGOVEM_{t-1} + b_2 DEBT_{t-1} + B_3 WHELD_{t-1} \\ + b_4 COMPLEXITY_{t-1} + b_5 REVCEN_{t-1} + b_6 AID_{t-1}$$

Model 3 is the *responsive government model of transfers*, which includes the *INCOME* variable from the responsive government model of domestic purchases, based on the expectation that if greater income equity is itself a public good,⁶² citizens should demand higher relative levels of transfers as they become wealthier.⁶³ Governments controlled by Democrats are expected to increase relative transfers, while Republican governments are expected to hold the line on transfers.⁶⁴ The model also assumes that the share of the population receiving transfer benefits influences transfer spending.⁶⁵ Furthermore, it is assumed that the effect of share of the population receiving transfer benefits is greater when Democrats control the government.⁶⁶ Finally, the model reflects the role unemployment benefits plays as an automatic stabilizer. Thus, the responsive government model of transfers can be specified as the following.

$$(3) \quad TRANSFERS_t = b_0 + b_1 INCOME_{t-1} + b_2 VETPOP_{t-1} + B_3 OLDPOP_{t-1} \\ + b_4 POORPOP_{t-1} + b_5 PARTYNAT_{t-1} + b_6 DEMELEC_{t-1} + b_7 REPELEC_{t-1} \\ + b_8 VETPOP_{t-1} * PARTYNAT_{t-1} + b_9 OLDPOP_{t-1} * PARTYNAT_{t-1} \\ + b_{10} POORPOP_{t-1} * PARTYNAT_{t-1} + b_{11} UNEMPL_t$$

Last, and in contrast, the *excessive government model of transfers* emphasizes narrow self-interest on the part of government officials. The model assumes that elected officials, acting as political entrepreneurs, increase transfer benefits to groups with substantial voting power to try to attract their votes.⁶⁷ Moreover,

⁶² Page (1983).

⁶³ Thurow (1971).

⁶⁴ Higgs (1985). The model includes *PARTYNAT* – which is similar to *PARTY* (described in note 12), but excludes control of governorships given the outsized role of the federal government on transfers spending. To specify the ratchet effect posited by Higgs (1985), two additional variables are included in the model—*DEMELEC_{t-1}* and *REPELEC_{t-1}*—that are, respectively, the number of presidential elections between 1949 and year *t* in which Democrats, or Republicans, controlled the presidency and both houses of Congress.

⁶⁵ The model includes *VETPOP*, *OLDPOP* and *POORPOP* (as measured, respectively, by the proportion of population comprising veterans, those over sixty-five, and those falling below the federal poverty level).

⁶⁶ The conditional nature of effects is specified as interaction between each of *VETPOP*, *OLDPOP*, *POORPOP* and *PARTYNAT* (as defined in note 17).

⁶⁷ Peltzman (1980).

politicians time the benefit increases for maximum electoral advantage by granting them during election years.⁶⁸ Also, the model includes the same set of variables in the excessive government model of domestic purchases designed to reflect political manipulation of fiscal illusions and the impact of fiscal centralization.⁶⁹ Therefore, the excessive government model of transfers is as follows.

$$(4) \quad \begin{aligned} TRANSFERS_t = & b_0 + b_1 VET : VOTE_{t-1} + b_2 POOR : VOTE_{t-1}, \\ & + b_3 OLD : VOTE_{t-1} + b_4 FARM : VOTE_{t-1} + b_5 REVCEN_{t-1} + b_6 AID_{t-1} \\ & + b_7 DEBT_{t-1}, + b_8 WHELD_{t-1} + b_9 COMPLEX_{t-1} + b_{10} NUMELEC_1 \\ & + b_{11} VET : VOTE_{t-1} * ELECTION_{t-1} + b_{10} POOR : VOTE_{t-1} * ELECTION_t \\ & + b_{13} OLD : VOT_{t-1} * ELECTION_t + b_{14} FARM : VOT_{t-1} * ELECTION_t \end{aligned}$$

Berry and Lowery's tests of these models for the period 1948–82 data found strong support for several aspects of the responsive government models and much less support for the excessive government models.⁷⁰ But their empirical results are now quite dated. As a byproduct of using Berry and Lowery's models as a base for testing our own propositions about the impact of government's relative cost on the real size of a government (or on the real levels of purchases and transfer), we will be able to replicate the estimation of Berry and Lowery's models over the longer period (1947–2012) for which we have data. In this

68 Tufte (1978). Accordingly, the model includes *VET:VOT*, *OLD:VOT*, *POOR:VOT* and *FARM:VOT* (as measured, respectively, by the proportion of the voting age population comprising veterans, those over sixty-five, those falling below the federal poverty level, and farmers). The model also includes *ELECTION*—a dummy variable indicating whether it is a presidential election year (1=yes, 0=no)—and specifies interaction between *ELECTION* and each group size variable. [Note that Berry and Lowery's (1987b) model did not include *ELECTION* as a separate term. However, excluding a term for *ELECTION* would constrain the effect of *ELECTION* on *TRANSFERS* to zero when each of *VET:VOT*, *OLD:VOT*, *POOR:VOT* and *FARM:VOT* equals zero. Since this is not a reasonable assumption, proper specification of Berry and Lowery's interaction hypothesis requires including *ELECTION* in the model.] To specify that transfer increases occurring in election years do not disappear entirely in nonelection years, a variable—*NUMELEC*—measuring the number of presidential elections occurring since 1949 is included.

69 Specifically, the model includes *WHELD*, *DEBT*, *COMPLEX*, *REVCEN* and *AID* (as defined in notes 14 and 15).

70 More specifically, they found strong support for the Wagner's Law income and demographic hypotheses in the responsive domestic purchases model and support for the Wagner's Law income, party control, and Keynesian unemployment hypotheses in the responsive transfers model. For the excessive government hypotheses, only the fiscal illusion hypothesis in the transfers model generated much in the way of support.

replication, as reported largely in notes, we will also be able to take advantage of improvements in time series methods since their results were published.

To test our Baumol's Disease propositions, we add a measure of the cost of government goods and services relative to costs in the overall economy (government's relative cost) to each of the four models presented above. For this purpose, we use a variable constructed by Semat et al.⁷¹ Their study reported strong support for the primary effect of Baumol's Disease on government costs—that the relative price of government goods and services increase over time largely due to productivity differentials between the public and private sectors. Their measure of government's relative cost is the ratio of the implicit price deflator (IPD) for government purchases to the implicit price deflator for GDP. This variable—to be denoted *Government's Relative Price*—measures the cost of a fixed “market basket” of government goods and service relative to the cost for a fixed basket of goods and service in the U.S. economy as a whole. As seen in [figure 1](#), the value of *Government's Relative Price* has increased rather steadily from 1948 to 2010.

Now that we have operational definitions of the real level of government transfers (measured by *TRANSFERS*), the real level of government purchases (measured by *PURCHASES*), and the cost of government goods and services relative to costs in the overall economy (measured by *Government's Relative Price*), we can derive testable predictions from the four propositions introduced earlier:

Withering State Hypothesis⁷²: As *Government's Relative Price* increases, both *PURCHASES* and *TRANSFERS* decline.

Surviving State Hypothesis⁷³: As *Government's Relative Price* increases, both *PURCHASES* and *TRANSFERS* are unchanged.

Withering Purchases/Prospering Transfers Hypothesis: As *Government's Relative Price* increases, (i) *PURCHASES* declines and (ii) *TRANSFERS* increases.

Surviving Purchases/Prospering Transfers Hypothesis: As *Government's Relative Price* increases, (i) *PURCHASES* remain stagnant and (ii) *TRANSFERS* increases.

⁷¹ Semat et al. (2015).

⁷² We use the term “proposition” for an expectation involving theoretical concepts, and the term “hypothesis” for a prediction involving empirical indicators.

⁷³ Since the shared dependent variable of the Withering State and Surviving State *Propositions* is the real size of government, but the observed dependent variables of the Withering State and Surviving State *Hypotheses* disaggregate the size of government into *PURCHASES* and *TRANSFERS* components, our empirical tests assume that the expectations reflected in the Withering State and Surviving State *Propositions* apply both to the level of government purchases and the level of transfers. Since these two propositions do not distinguish between purchases and transfers, we believe this is a reasonable assumption.

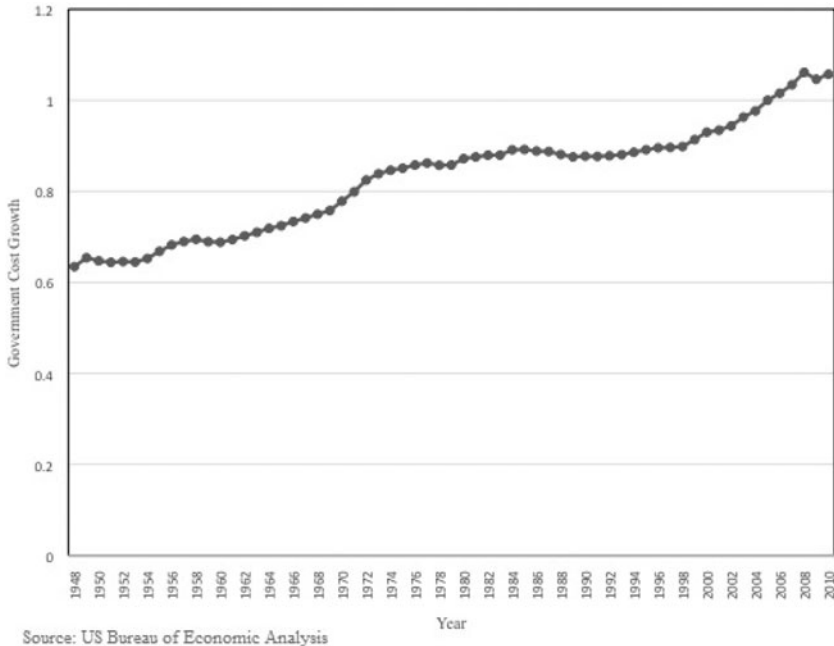


Figure 1: Government Cost Growth, 1948–2010

Testing the enhanced government growth models: Data and estimation issues

Given that the CITIBASE data set used by Berry and Lowery is no longer publicly available, we recreated each of their measures from the United States' Bureau of Economic Analysis' (BEA) National Income Product Account (NIPA) tables, with some supplemental data from the *Statistical Abstract of the United States*.⁷⁴ Annual observations were collected for the time period of 1947 to 2010, with the exception of models including *Tax Complexity*, for which disaggregated data was unavailable prior to 1959.⁷⁵ Inclusion of dummy variables did not indicate any

⁷⁴ Berry and Lowery (1987b). Estimates of impoverished population prior to 1959 drawn from Plotnick (1998). Robustness tests did not indicate a substantive difference between time periods.

⁷⁵ The Herfindahl Index of tax instruments measuring tax complexity as modeled after Berry and Lowery (1987b), incorporating personal income, sales, corporate income, customs, excise, government business profits, and payroll taxes. Robustness tests did not indicate a substantive difference between time periods in terms of how complexity influences spending shares.

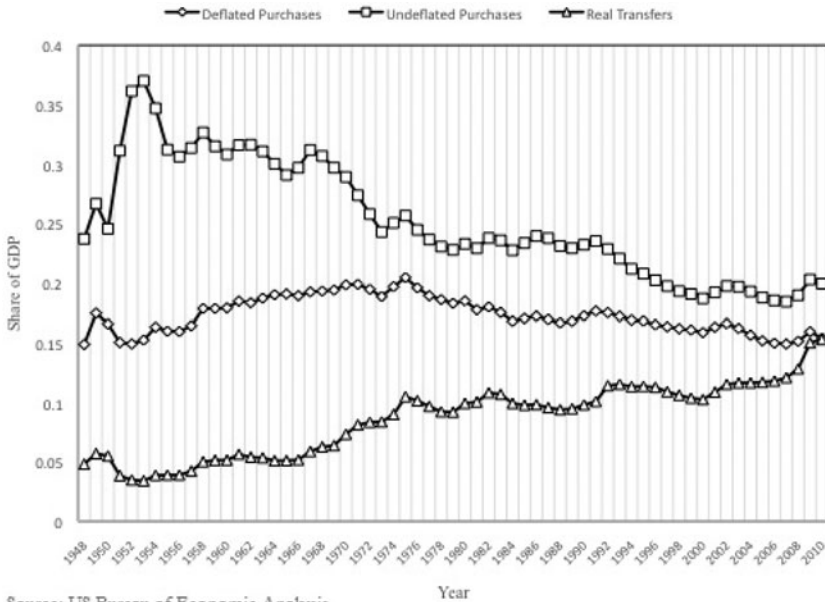
significant difference in how the independent variables bear on the dependent variables between the period examined by Berry and Lowery and the expanded time period examined here.⁷⁶ Thus, we are confident that the replication portion of this analysis matches well with Berry and Lowery's.⁷⁷ The core dependent variables in the analysis are the same as Berry and Lowery's: the real share of GDP devoted to public sector domestic purchases (PURCHASES) and public sector transfers (TRANSFERS), the appropriate deflation of which has already been discussed.⁷⁸ As evident in [figure 2](#), the use of different deflators for the numerators of the two measures has a significant impact on their temporal paths. There is a steady rise in the real share of GDP devoted to transfers, which is the same as its nominal share since both are deflated by the GDP IPD. And while the nominal GDP share of purchases is nearly flat across the whole time period, its real values indicate a sharp decline from approximately a third of GDP in the 1950s to roughly a fifth of GDP at the end. This difference in the real and nominal values of purchases GDP share is a result of employing different deflators for the two elements of the ratio measure of purchase share and clear evidence of the primary impact of Baumol's Cost Disease on government purchases. And the key independent variable for our extension of the original analysis is RELATIVE PRICE, the ratio of the IPD for government purchases to the IPD for GDP, as seen in [figure 1](#).

Two estimation problems were given considerable attention. First, time series methods have progressed significantly since Berry and Lowery's analysis. More specifically, we address the possibility of our results being excessively influenced by the persistence of our variables across time. Augmented Dickey-Fuller tests indicated that we could not reject the assumption of the presence of a unit root process within any of the raw dependent variables; differencing each series allowed us to reject this assumption. Independent variables have also been differenced in the models reported below; Engle-Granger tests for co-integration (using Schaffer (2010)) indicated that we could not assume our variables were co-integrated. Given these limitations in the data, our analysis necessarily focuses on short-term, year-to-year changes in our independent variables driving short-term, year-to-year changes in the growth of each variety of spending, assuming, in other words that the impact of Baumol's disease on real spending is almost immediate and does not accumulate over time. This, of course, is a very rigorous

⁷⁶ Berry and Lowery (1987b).

⁷⁷ *Ibid.*, 419. Our specification differs in one respect: the inclusion of a dummy for election years in the excessive purchases models. We have appended this to Berry and Lowery's specifications in order to more accurately reflect their expectations regarding the influence of the poor, farming, and veteran voting blocs.

⁷⁸ *Ibid.*



Source: US Bureau of Economic Analysis

Figure 2: Nondefense Public Sector Shares of GDP, 1948–2010

test of our hypotheses, a test that militates against our finding supportive results. However, our use of differenced variables also means that we rely far less upon autoregressive (AR) corrections than Berry and Lowery: Bausch-Godfrey tests indicated that the models show no evidence of serial correlation. Taken together, this analysis is more rigorous than the original study.

Second, as with the original study by Berry and Lowery, collinearity posed a significant concern for interpreting the results on our explanatory variables.⁷⁹ In order to account for this, we estimated alternative specifications of the models in which variables exhibiting a strong possibility of collinearity (as indicated by exceptional Variance Inflation Factor values), where one or another collinear variable was excluded in turn. Only models in which such exclusion led to a variable exhibiting statistical significance not evident in the fully specified model are reported here.

⁷⁹ Ibid.

Results

The results for the *responsive government domestic purchases model* are presented in models 1 and 2 of [table 1](#), with the second adding *Relative Price* to the initial specification. The replication results in the models are similar, but somewhat weaker for the responsive government model of domestic purchases than those reported by Berry and Lowery.⁸⁰ More important for our present purposes, there is no evidence that changes in government's relative costs *are* strongly related to year-to-year changes in GDP share of real domestic purchases. In model 2, the coefficient for *RELATIVE PRICE*—our measure of this concept—is not significant, and it is wrongly signed in any case in respect to the Withering State Hypothesis.⁸¹ Thus, the steady decline in the real share of GDP devoted to public sector purchases over time observed in [figure 2](#) cannot be attributed to the secondary impact of Baumol's cost disease. The evidence of a null effect is consistent with either the Surviving State Hypothesis or the Surviving Purchases/Prospering Transfers Hypothesis, each of which predicts that the expansion of societal wealth derived from more technologically progressive sectors of the economy provides sufficient revenue to maintain public goods purchases provision over time, despite the cost pressures arising from Baumol's Disease.⁸²

80 Ibid. As with the original study, *YOUNG* is positively signed and statistically significant in both model 1 and model 2, suggesting support for the hypothesis that changes in domestic purchases grow in response to an increasing year-to-year growth in the share of the population under age eighteen. This suggests that the baby boom had a profound impact on domestic government purchases as its representatives moved from K through 12 schools, to universities and prisons, and then on to nursing homes. We find that changes in (Democratic) *Party Control* of the federal government and governorships is significant, but in the direction opposite to our expectations. This suggests that a short-term positive change towards more Republican control of the government in a prior year is associated with a short-term positive change in non-defense purchases. Given that secondary tests on capital purchases, discussed in the following note, indicated a positive relationship with *Democratic Party Control* as expected, this outcome may be driven primarily by short-term expansions of civilian personnel in Republican-favored policy areas. Due to our models' use of differenced *Party Control*, we cannot empirically test the broader expectation that long-run Democratic control leads to greater levels of government purchases. Further, neither *Personal Income* nor *Households* generated statistically significant coefficients in either model, in contrast with the positive and significant coefficients of the original study, which were interpreted as strong support for Wagner's Law.

81 Following the suggestion of a reviewer, we also tested the models using a simple difference between deflators. There was no substantive difference in the results, with the exception that *Taxes Withheld* in model 5 of [table 4](#) was barely not significant.

82 Berry and Lowery (1987a), 413 also examined a number of supplemental hypotheses regarding domestic capital expenditures exclusive of employee compensation as a way of better distinguishing the responsive and excessive government models of domestic purchases. The results are

Table 1: Tests of the Responsive Purchases Model

Ind. Variables	Dep. Variable: Real Purchases Share	
	Model 1	Model 2
Democratic Control (t-1)	−0.008* 0.004 −1.742	−0.008* 0.004 −1.738
Young Pop. (t-1)	0.414** 0.120 3.446	0.429** 0.121 3.529
Personal Income (t-1)	−1.452 3.896 −0.373	−2.369 4.038 −0.587
Households (t-1)	−0.003 0.010 −0.277	−0.003 0.010 −0.306
Relative Price	–	0.060 0.068 0.887
Intercept	0.001	0.001
N	59	59
R-sq	0.243	0.254

Two Tailed Test: *p < 0.1, **p < 0.05, ***p < 0.001.

Values under coefficients are, first, standard errors and then t-values.

The models in [table 2](#) test the *excessive government domestic purchases* model. Overall, as seen in the first column of the table, we find quite weak support for the excessive government model of domestic purchases, a pattern that is consistent

available in Appendix A; the refinement of the modeling technique has led to some similarities and some differences from the original study. The coefficient for *Households* is significant and positively signed, suggesting that as income rises and the number of households increases, domestic capital purchases increase. Also in contrast with the original study, we find a significant, positive relationship between *Democratic Party Control* and increases in capital expenditures, potentially suggesting even sharper support for the responsive model in this area. Income is not found to be significant. As with general domestic purchases, *Relative Price* and capital expenditures are not significantly related to these additional dependent variables, as anticipated by Baumol's second hypothesis that increasing societal wealth provides resources by which to continue to fund purchases even as real costs increase over time. For civilian government employment (Berry and Lowery (1987b), 412), our results do in fact comport with the original findings in either case; both capital expenditures and general nondefense purchases appear to be significantly related to civilian employment. Again, the estimate for *Relative Price* was not significant.

with the findings reported in the original study.⁸³ More importantly for our present purposes, the inclusion of our measure of government's relative cost in model 2 of [table 2](#) again yields evidence consistent with either the Surviving State Proposition or the Surviving Purchases/Prospering Transfers Proposition, echoing the results for the responsive government purchases model in [table 1](#). That is, changes in the relative costs of producing public sector goods and services do not seem to be associated with changes in the share of GDP devoted to real domestic purchases.

Next, we turn attention to our models of government transfers, starting with the results for the *responsive government* models, which are presented in [table 3](#). Model 1 includes a neutral measure of presidential election accumulation, while model 2 contains separate measures for presidential elections won by Democrats and Republicans. In terms of the replication models, the results were somewhat weaker than those reported by Berry and Lowery, especially so in terms of the Wagner's Law *income* variable and party control of government.⁸⁴ But the results also generated consistent results for several other variables. Overall, then, these results provide some support for the responsive government interpretation of changes in the share of GDP devoted to real transfer spending.⁸⁵ When *Relative*

83 Similar to the original test of this model, we find evidence of a statistically significant positive relationship between the changes in purchases and *Civilian Employees* as a proportion of the voting age population. In contrast with the initial study, this relationship does disappear as expected when changes in civilian compensation are accounted for (results not reported). Yet this is hardly evidence consistent with the spirit of an "excessive" government model – since the share of employment in the public sector has declined steadily since the mid-1970s (Semat et al. (2015)). The result implies that as the percent of civilian employees has tended to decline, the impact has been a permanent decline in the level of domestic government purchases. We do not find significant coefficients for *Revenue Centralization*; *Intergovernmental Aid* was significant and positively signed in the first model (consistent with expectations) but this relationship disappears in the second model. As with Berry and Lowery's (1987b) results, the coefficient for *Debt* is negatively signed—contrary to the fiscal illusion hypothesis. Our results do, however, lend support for several hypotheses that were not supported in the original study. Again, reflecting the fiscal illusion hypothesis, the coefficients for *Complexity* and *Taxes Withheld* are significant and positively signed, the former in model 1 and the latter in model 2, after excluding *Complexity* for reasons of collinearity and including *Relative Price*. We estimated a separate model (omitted for space) where *Complexity* was excluded without including *Relative Price*; *Taxes Withheld* was not significant in this specification.

84 Berry and Lowery (1987a).

85 Both present results that partially resemble those of the original study; changes in *Unemployment* and the *Veteran* share of the population are positively and significantly associated with changes in public transfers as a share of GDP, as predicted by the model. In contrast with the original study, however, the coefficient for growth in the impoverished share of the population is also positive and statistically significant, consistent with the model's prediction. On the other hand, we do not find a significant relationship between changes in transfers as a share of GDP and

Table 2: Tests of the Excessive Purchases Model

Ind. Variables	Dep. Variable: Real Purchases Share	
	Model 1	Model 2
Civ Gov't Employment (t-1)	0.013**	0.008*
	0.004	0.005
	3.478	1.843
Debt (t-1)	-0.028	-0.007
	0.019	0.014
	-1.441	-0.458
Taxes Withheld (t-1)	-0.214*	0.091*
	0.112	0.047
	-1.905	1.947
Complexity (t-1)	0.406**	-
	0.176	
	2.311	
Rev. Centralization (t-1)	0.006	-0.100
	0.085	0.084
	0.076	-1.198
Aid (t-1)	-0.220**	-0.086
	0.087	0.104
	-2.530	-0.827
Relative Price	-	-0.001
		0.076
		-0.014
Intercept	-0.001	-0.001
N	50	61
R-sq	0.340	0.196

Two Tailed Test: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

Values under the coefficients are, first, standard errors and then t-values.

Some variables divided by constants for readability.

Price is added (i.e., models 3 and 4), the results are similar to those originally reported by Berry and Lowery. But the inclusion of RELATIVE PRICE, our measure of the cost pressures associated with Baumol's disease, matters. Both RELATIVE PRICE coefficients are significant and positively signed. This suggests that changes in the costs of goods and services produced by the public sector are associated with increases in transfer spending as a share of GDP. This, of

changes in *Income*, *National Party* (indicating the extent of Democratic Party control of Congress and the Presidency in the current year), any of the elections measures, or the *Senior* population. We also tested multiple alternative specifications to account for the collinearity concerns expressed by the original study, but they yielded substantively identical results to the models presented here.

Table 3: Tests of the Responsive Transfers Model

Ind. Variables	Dep. Variable: Real Transfers Share			
	Model 1	Model 2	Model 3	Model 4
Unemployment (t-1)	44.528***	44.261***	43.465***	43.213***
	3.566	3.550	3.561	3.566
	12.487	12.470	12.206	12.116
Personal Income (t-1)	0.343	0.361	-1.013	-1.063
	3.148	3.053	3.110	3.047
	0.109	0.118	-0.326	-0.349
National Party (t-1)	17.985	17.767	15.362	15.437
	15.813	15.725	15.599	15.590
	1.137	1.130	0.985	0.990
No. Elections	4.128	-	0.599	-
	8.466		8.355	
	0.488		0.072	
Veteran Pop. (t-1)	0.346**	0.363**	0.301**	0.318**
	0.133	0.133	0.132	0.133
	2.595	2.724	2.282	2.397
Senior Pop. (t-1)	-0.771	-0.832	-0.595	-0.650
	0.599	0.597	0.587	0.590
	-1.286	-1.394	-1.013	-1.103
Poor Pop. (t-1)	0.091**	0.090**	0.081**	0.080**
	0.028	0.028	0.028	0.028
	3.246	3.205	2.929	2.855
Democrat Elections	-	2.046	-	-2.282
		11.310		11.224
		0.181		-0.203
Republican Elections	-	20.311	-	15.013
		14.518		14.362
		1.399		1.045
Relative Price	-	-	0.094**	0.090**
			0.044	0.045
			2.143	2.015
Intercept	0.002**	0.002**	0.002*	0.002*
N	62	62	61	61
R-sq	0.785	0.792	0.800	0.804

Two Tailed Test: *p < 0.1, **p < 0.05, ***p < 0.001.

Values under the coefficients are, first, standard errors and then t-values.

Some variables divided by constants for readability.

course, is in accordance with our Prospering Transfers Proposition, but inconsistent with both of Baumol's expectations: the Withering State Proposition and the Surviving State Proposition.

Our results for the final model, the *excessive government model of transfers*, are presented in [table 4](#). Model 1 presents the full replication,⁸⁶ for which none of the coefficients is statistically significant at even the 0.10 level, in part at least due to collinearity.⁸⁷ These results are consistent with Berry and Lowery's lack of empirical support for the excessive government transfers model.⁸⁸ But when we add *Relative Price* (see model 4), its coefficient is positive and statistically significant, indicating that cost pressures on purchases are associated with increased spending on transfers relative to GDP. The inclusion of RELATIVE PRICE, combined again with the exclusion of *Debt* in model 5,⁸⁹ also generated significant estimates for both *Poor Vote Share* and *Taxes Withheld*. The coefficient for *Taxes Withheld* becomes significant and negatively signed, in contrast with both the findings of the original study and the expectations of the excessive government transfers model. But *Poor Vote-share*, by contrast, does generate a significant and positively signed coefficient as would be expected by the excessive government model. In sum, then, our results provide modestly more support than in the original study for the excessive government model of transfers when RELATIVE PRICE is added to the model. More importantly, it provides strong evidence that cost pressures on purchases are associated with increased transfer shares of GDP, lending support to the Prospering Transfers Proposition, but inconsistent with the Withering State and the Surviving State Propositions. Indeed, taking into account the results of all of our tests—across [tables 1, 2, 3, and 4](#)—the only one of the four propositions considered in this paper consistent with all empirical evidence about the effects of government's relative cost is the Surviving Purchases/ Prospering Transfers Proposition. As the cost pressures associated with Baumol's disease rise (i.e., as the cost of government goods and services increases relative to costs in the overall economy), (i) the real level of government purchases is stagnant, while (ii) the real level of government transfers increases.

86 Our specifications differ from those of the original study in that we included a dummy variable for *Election Year*, which was included in Berry and Lowery's theoretical model but omitted from the actual specification.

87 When *Debt* is excluded given multicollinearity in model 2, both *Complexity* and *Veteran Vote Share* become significant and positively signed. Similarly, we find a significant positive coefficient for *Debt* when *Complexity* is excluded in model 3. None of a number of unreported models attempting to overcome the consequences of collinearity found any significant relationship between transfer spending GDP shares and *Revenue Centralization*, *Aid*, or the *Senior* or *Farmer* populations as proportion of the voting-eligible population.

88 Berry and Lowery's (1987b).

89 We estimated a model similar to model 3 (with *Complexity* excluded) with the addition of *Relative Price*. Its results were substantively identical to those of model 3 and model 4.

Table 4: Testing the Excessive Model for Transfers

Ind. Variables	Dep. Variable: Real Transfers Share				
	Model 1	Model 2	Model 3	Model 4	Model 5
Election Year	-2.288	0.817	-2.710	-6.53	-4.85
	19.771	19.515	17.735	18.95	18.63
	-0.116	0.042	-0.153	-0.34	-0.26
No. Elections	8.090	2.512	5.138	-3.3	-7.28
	19.315	18.468	18.169	19.14	17.97
	0.419	0.136	0.283	-0.17	-0.41
Debt (t-1)	0.038		0.031*	0.024	
	0.038		0.017	0.037	
	0.989		1.780	0.642	
Taxes Withheld (t-1)	-0.047	-0.149	0.082	-0.15	-0.22*
	0.167	0.131	0.054	0.167	0.128
	-0.279	-1.140	1.520	-0.91	-1.72
Complexity (t-1)	0.277	0.437*		0.386	0.489**
	0.272	0.219		0.264	0.208
	1.019	1.999		1.461	2.349
Rev. Centralization (t-1)	0.047	-0.015	-0.067	0.127	0.093
	0.138	0.123	0.098	0.137	0.125
	0.342	-0.122	-0.681	0.928	0.744
Aid (t-1)	-0.118	-0.083	-0.017	-0.15	-0.13
	0.128	0.123	0.120	0.123	0.118
	-0.921	-0.672	-0.138	-1.23	-1.11
Veteran Vote-share (t-1)	0.265	0.374*	0.243	0.247	0.313
	0.228	0.200	0.170	0.218	0.191
	1.159	1.874	1.430	1.134	1.64
Farmer Vote-share (t-1)	0.206	-0.218	1.739	-0.7	-1
	2.095	2.050	1.749	2.04	1.969
	0.098	-0.106	0.994	-0.34	-0.51
Senior Vote-share (t-1)	-0.111	-0.059	-0.618	0.277	0.328
	0.700	0.698	0.570	0.691	0.681
	-0.158	-0.085	-1.085	0.401	0.482
Poor Vote-share (t-1)	0.073	0.145	-0.005	0.122	0.169*
	0.117	0.092	0.046	0.114	0.087
	0.628	1.588	-0.107	1.074	1.932
Relative Price				0.216**	0.227**
				0.099	0.096
				2.187	2.352
Intercept	0.003*	0.003**	0.003**	0.001	0.001
N	50	50	62	50	50
R-sq	0.242	0.222	0.190	0.328	0.321

Two Tailed Test: *p < 0.1, **p < 0.05, ***p < 0.001.

Values under the coefficients are, first, standard errors and then t-values.

Some variables divided by constants for readability.

Conclusion

With regard to the replication function of our analysis, the doubling of the time period and the use of more rigorous time series methods produced results largely consistent with those of Berry and Lowery for both the *responsive government and excessive government transfers* models—somewhat supportive of the former, but largely unsupportive of the latter.⁹⁰ There was a modest weakening of support in our results for the responsive government model in comparison to the earlier study. But this was certainly not counterbalanced by any discernible improvement in the excessive government models in our results compared to those of Berry and Lowery's original results.

More importantly for our purposes, our extension of the Berry and Lowery specifications was essential for more than purposes of replication.⁹¹ That is, to validly assess the several competing hypotheses on the secondary impact of Baumol's Cost Disease on the real GDP share of public sector spending, we need to account for the other reasons the real levels of transfer and purchases spending might change. We have argued that Berry and Lowery's model provides the best available vehicles for doing this.⁹² Thus, we added to the Berry and Lowery specifications a measure of cost disease pressures—RELATIVE PRICE—to assess how they influence the proportion of GDP devoted to domestic purchases and to transfers. Our results indicate, first, that the older, presumably wiser, Baumol was right in suggesting that changes in government purchases share of GDP should not be greatly influenced by cost disease pressures.⁹³ Neither of the RELATIVE PRICE coefficients in the responsive and excessive government models is significant.

Yet, our changes in real transfers findings suggest that neither the optimistic nor the pessimistic Baumol were correct in assessing how cost pressures on government purchases might influence relative transfer shares. Instead of a negative estimate, as hypothesized in Baumol's earlier work, or a nonsignificant estimate, as hypothesized in Baumol's later interpretation, RELATIVE PRICE generated a

90 Berry and Lowery (1987b). The largest substantive change from the original study for the responsive government models concern the considerably weaker support provided for the income hypothesis of Wagner's Law. And the election and party control hypotheses were supported for neither the responsive nor excessive government models. Still, several supplemental analyses not reported here, but discussed in footnotes, suggest that the responsive government party and Wagner's Law hypotheses remain viable alternatives when considering the growth of domestic purchases as shares of GDP.

91 Berry and Lowery (1987b).

92 Ibid.

93 Baumol (2012).

positive and significant estimate in both the excessive and responsive government models of the GDP share of transfers.⁹⁴ This is consistent with our—if not Baumol's—view of public spending as a hybrid production process in which cost disease pressures on the purchases side of the ledger create incentives to rely more on transfer spending, which is less subject to cost disease pressures, when public spending solutions of pressing policy problems are called for.

Taken together with the temporal trends on domestic purchases and transfers GDP shares in [figure 2](#), our results suggest that long-term budget developments in the United States are dominated by two characteristics. The first is a holding of the line on the nominal purchases share of GDP, which, of course, entails a real reduction in the purchase share over time. Thus, while cost disease pressures may have played a role in capping the nominal government purchase as a share of GDP, thus leading to a decline in the real purchases share of GDP, they have not played a direct role in the year-to-year pace of declining real purchase shares. The causes of that decline lie elsewhere than Baumol's cost disease per se, although, as we have discussed, a money illusion may well play a role. But the secondary consequences of Baumol's cost disease do matter more directly for the transfer shares of GDP. Our results suggest that over time, as cost disease pressures intensified on the purchases side of the ledger, government has increasingly relied on transfer spending. In short, cost disease pressures on purchases have created a growing bias toward greater reliance on transfers, a bias that has grown with the increasing impact of Baumol's disease on purchases over time.

This is important in that Paul Krugman, Ezra Klein, and Mark Thoma have noted that one of the key budgetary trends in the United States is the government's steady progression toward becoming what amounts to an insurance company with an army attached.⁹⁵ Our results in the transfers share models perhaps account for one reason why this is so. Compared to domestic purchases, transfers are less directly plagued by cost disease pressures. Given the accumulation of cost pressures on purchases, this should lead over time, to increased reliance on transfers and, thus, a shift in the balance of purchases and transfers in the budget. The good news from the perspective of the more optimistic Baumol is that this substitution, along with greater societal wealth generated by more technologically progressive

⁹⁴ Ibid. (1967; 2012).

⁹⁵ *The New York Times* 24 January 2013, "An Insurance Company With an Army." Paul Krugman. <http://krugman.blogs.nytimes.com/?module=BlogMain&action=Click®ion=Header&pgtype=Blogs&version=Blog%20Post&contentCollection=Opinion>; *The Washington Post* 16 July 2015, "The U.S. Government: An Insurance Conglomerate Protected by a Large, Standing Army." Ezra Klein. http://voices.washingtonpost.com/ezra-klein/2011/02/the_us_government_an_insurance.html; Thoma (2013).

sectors of the economy, provides another reason why Baumol's disease need not be viewed as leading to an inevitable withering of the state. Indeed, our results almost certainly underestimate the power of such substitution in preserving the scale and scope of the public sector since we considered only spending.⁹⁶ Tax expenditures too should be viewed as transfers in lieu of using direct purchases as policy solutions.⁹⁷

This does not mean, of course, that the substitution of transfers for purchases offers an ideal solution to Baumol's disease in the public sector. First, we have noted earlier that in some and perhaps many cases, direct production of goods and services may not be readily substitutable. Second, while we found that cost disease pressures on purchases do seem to stimulate greater relative transfer spending, they do not, consistent with the older Baumol, seem to diminish domestic purchases per se.⁹⁸ That is, across the purchases and transfers models, we found strong support for the Surviving Purchases/Prospering Transfers Proposition. Thus, the substitution of transfers for purchases that has occurred represents an addition to the public budget. To the extent that the real size of the overall budget is a problem, and it certainly is to those on the right, the substitution pattern we have observed increases the overall size of government. And third, it is not clear all substitutable transfers actually avoid Baumol's disease. In many cases, they are likely to do so. In programs such as general welfare, Social Security, and nutrition support, transfers entail spending across the array of goods and services provided by the private economy. Thus, they should bear cost disease pressures in the same manner as the general economy, which is why we deflated the numerator of transfers share by the IPD for GDP. But for other types of transfers, including Medicaid and school vouchers, such transfers merely shift spending from a technologically stagnant area of the public sector to technologically stagnant private production. In such cases, the cost pressures associated with Baumol's disease are not likely obviated. They are merely relocated. In sum, the pattern of substitution of transfers for domestic purchases may help alleviate the impact of Baumol's disease, but they will almost certainly not eliminate its full impact.

⁹⁶ Baumol (2012).

⁹⁷ Thuronyi (1988); Howard (1999); Burman, Leonard, Geissler, and Toder (2008).

⁹⁸ Baumol (2012).

References

- Bates, Laurie J. and Rexford E. Santerre. 2013a. "Does U.S. Health Care Sector Suffer from Baumol's Cost Disease? Evidence from the 50 States." *Journal of Health Economic* 32: 386–91.
- Bates, Laurie J. and Rexford E. Santerre. 2013b. "Is the U.S. Private Education Sector Infected by Baumol's Cost Disease? Evidence from the 50 States." Munich Personal RePec Archive. http://mpira.ub.uni-munchen.de/52300/1/MPRA_paper_52300.pdf.
- Bates, Laurie J. and Rexford E. Santerre. 2015. "Does Baumol's Cost Disease Account for Nonfederal Public-Sector Cost Growth in the United States? A New Test of an Old Idea." *Social Science Quarterly* 96 (1): 251–60.
- Baumol, William J. 1967. "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis." *The American Economic Review* 57 (3): 415–26.
- Baumol, William J. 2012. *The Cost Disease: Why Computers Get Cheaper and Health Care Doesn't*. New Haven, CT: Yale University Press.
- Baumol, William J. 1993. "Social Wants and Dismal Science: The Curious Case of the Climbing Costs of Health and Teaching." *Proceedings of the American Philosophical Society* 137 (3): 612–37.
- Baumol, William J., Sue Anne Batey Blackman, and Edward N. Wolff. 1985. "Unbalanced Growth Revisited: Asymptotic Stagnancy and New Evidence." *The American Economic Review* 75 (4): 806–17.
- Beck, Morris. 1976. "The Expanding Public Sector: Some Contrary Evidence." *National Tax Journal* 29 (1): 15–21.
- Berry, William D. and David Lowery. 1984. "The Growing Cost of Government: A Test of Two Explanations." *Social Science Quarterly* 65 (3): 735–49.
- Berry, William D. and David Lowery. 1987a. *Understanding United States Government Growth: An Empirical Analysis of the Postwar Era*. New York: Praeger.
- Berry, William D. and David Lowery. 1987b. "Explaining the Size of the Public Sector: Responsive and Excessive Government Interpretations." *The Journal of Politics* 49 (2): 401–40.
- Blais, Andre, Donald Blake, and Stephane Dion. 1993. "Do Parties Make a Difference? Parties and the Size of Government in Liberal Democracies." *American Journal of Political Science* 37 (1): 40–62.
- Borcherding, Thomas E. 1977. "The Sources of Growth of Public Expenditures in the United States, 1902–1970." In *Budgets and Bureaucrats*, edited by Thomas E. Borcherding. Durham, NC.: Duke University Press: 45–70.
- Borcherding, Thomas E. 1985. "The Causes of Government Expenditure Growth: A Survey of the US Evidence." *Journal of Public Economics* 28 (3): 359–82.
- Bradford, David F., Richard A. Malt, and Wallace E. Oates. 1969. "The Rising Cost of Local Public Services: Some Evidence and Reflections." *National Tax Journal* 22 (2): 185–202.
- Buchanan, James. 1977. "Why Does Government Grow?" in *Budgets and Bureaucrats*, edited by Thomas E. Borcherding. Durham, NC: Duke University Press, 3–18.
- Buchanan, James M., and Gordon Tullock. 1977. "The Expanding Public Sector: Wagner Squared." *Public Choice* 31 (1): 147–50.
- Buchanan, James M. and Richard E. Wagner. 1977. *Democracy in Deficit*. New York: Academic Press.

- Burman, Leonard E., Christopher Geissler, and Eric J. Toder. 2008. "How Big are Total Individual Income Tax Expenditures, and Who Benefits from Them?" *The American Economic Review* 98 (2): 79–83.
- Cameron, David R. 1978. "The Expansion of the Public Economy: A Comparative Analysis." *American Political Science Review* 72 (4): 1,243–61.
- Colombier, Carsten. 2010. "Drivers of Health Care Expenditures: Does Baumol's Cost Disease Loom Large?" Paper Presented at the 66th Congress of the International Institute of Public Finance in Uppsala, Sweden.
- Craig, D. and A. J. Heins. 1980. "The Effect of Tax Elasticity in Government Spending." *Public Choice* 35: 267–75.
- Downs, Anthony. 1960. "Why the Government Budget is Too Small in a Democracy." *World Politics* 12 (4): 541–63.
- Estelami, Hooman, Donald R. Lehmann, and Alfred C. Holden. 2001. "Macro-Economic Determinants of Consumer Price Knowledge: A Meta-Analysis of Four Decades of Research." *International Journal of Research in Marketing* 18 (4): 341–55.
- Garand, James C. 1988. "Explaining Government Growth in the U.S. States." *American Political Science Review* 82 (3): 837–49.
- Garrett, Thomas A. and Russell M. Rhine. 2006. "On the Size and Growth of Government." *Federal Reserve Bank of St. Louis Review*. 88 (January/February).
- Goetz, Charles. J. 1977. "Fiscal Illusion in State and Local Finance." In *Budgets and Bureaucrats*, edited by Thomas E. Bocherding. Durham, NC: Duke University Press, 176–87.
- Hardwig, Jochen. 2008. "What Drives Health Care Expenditure? Baumol's Model of Unbalanced Growth Revisited." *Journal of Health Economics* 27: 603–23.
- Heller, Peter S. 1981. "Diverging Trends in the Shares of Nominal and Real Government Expenditure in GDP: Implications for Policy." *National Tax Journal* 34 (1): 61–74.
- Higgs, Robert. 1985. "Crisis, Bigger Government, and Ideological Change: Two Hypotheses on the Ratchet Phenomenon." *Explorations in Economic History* 22 (1): 1–28.
- Howard, Christopher. 1999. *The Hidden Welfare State: Tax Expenditures and Social Policy in the United States*. Princeton, NJ: Princeton University Press.
- Larkey, Patrick D., Chandler Stolp, and Mark Winer. 1981. "Theorizing About the Growth of Government: A Research Assessment." *Journal of Public Policy* 1 (2): 157–220.
- Lewis-Beck, Michael S., and Tom W. Rice. 1985. "Government Growth in the United States." *The Journal of Politics* 47 (1): 1–30.
- Lowery, David. 1987. "Electoral Stress and Revenue Structures in the American States Searching for the Elusive Fiscal Illusion." *American Politics Research* 15 (2): 5–46.
- Lowery, David and William D. Berry. 1983. "The Growth of Government in the United States: An Empirical Assessment of Competing Explanations." *American Journal of Political Science* 27 (4): 665–94.
- Lybeck, Johan A., and Magnus Henrekson. 2014. *Explaining the Growth of Government*. Amsterdam, North Holland: Elsevier.
- Marlow, Michael L. 1988. "Fiscal Decentralization and Government Size." *Public Choice* 56 (3): 259–69.
- Mintrom, Michael. 2000. *Policy Entrepreneurs and School Choice*. Washington, D.C.: Georgetown University Press.
- Neck, Reinhard and Michael Getzner. 2007. "Austrian Government Expenditures" Wagner's Law or Baumol's Disease." *International Business and Economics Research Journal* 6 (11): 49–66.

- Nordhaus, William D. 2006. "Baumol's Disease: A Macroeconomic Perspective." *The BE Journal of Macroeconomics* 8 (1): 1–39.
- Page, Benjamin I. 1983. *Who Gets What From Government*. Berkeley, CA: University of California Press.
- Peltzman, Sam. 1980. "The Growth of Government." *Journal of Law and Economics* 23 (2): 209–87.
- Piketty, Thomas. 2014. *Capital in the 21st Century*. Cambridge, MA: Harvard University Press.
- Plotnick, R. D. 1998. The Twentieth Century Record of Inequality and Poverty in the United States. Doctoral dissertation, University of California at Berkeley.
- Pommerene, W. W. and Friedrich Schneider. 1978. "Fiscal Illusion, Political Institutions, and Local Public Spending." *Kyklos* 31: 381–408.
- Schaffer, Mark E. 2010. "eGranger: Engle-Granger (EG) and Augmented Engle-Granger (AEG) Cointegration Tests and 2-step ECM estimation." (Accessed on 1 November 2015) <http://ideas.repec.org/c/boc/bocode/s457210.html>.
- Schneider, Mark, Paul Teske, and Michael Mintrom. 1995. *Public Entrepreneurs*. Princeton, NJ: Princeton University Press.
- Semat, Joshua, David Lowery, Suzanna Linn, and William D. Berry. 2015. "The Cost Growth of Government Revisited." *Business and Politics* 17 (4): 723–37.
- Shafir, Eldar, Peter Diamond, and Amos Tversky. 1997. "Money Illusion." *The Quarterly Journal of Economics* 112 (2): 341–74.
- Spann, Robert M. 1977a. "The Macroeconomics of Unbalanced Growth and the Expanding Public Sector: Some Simple Tests of a Model of Government Growth." *Journal of Public Economics* 8 (3): 397–404.
- Spann, Robert M. 1977b. "Public versus Private Provision of Governmental Services." In *Budgets and Bureaucrats*, edited by Thomas E. Borcherding. Durham, NC: Duke University Press, 100–29.
- Tarschys, Daniel. 1975. "The Growth of Public Expenditures: Nine Models." *Scandinavian Political Studies* 10: 9–31.
- Thoma, Mark. 2013. "Who First Said the US is 'An Insurance Company with an Army'?" *Economist's View*. (Accessed on 16 July 2015) <http://economistsview.typepad.com/economistsview/2013/01/who-first-said-the-us-is-an-insurance-company-with-an-army.html>.
- Thuronyi, Victor. 1988. "Tax Expenditures: A Reassessment." *Duke Law Journal* 37 (6): 1,155–206.
- Thurow, Lester. 1971. "Income Distribution as a Pure Public Good." *Quarterly Journal of Economics* 85: 327–26.
- Tufte, Edward R. 1978. *Political Control of the Economy*. Princeton, NJ: Princeton University Press.
- U.S. Bureau of Labor Statistics, *All Employees: Government* [USGOVT], retrieved from FRED, Federal Reserve Bank of St. Louis. (Accessed on 10 December 2014) <https://research.stlouisfed.org/fred2/series/USGOVT/>.
- Wagner, Adopf. 1877. *Finanzwissenschaft*, pt. 1. Leipzig, Germany: C. F. Winter.
- Wagner, Richard E. 1976. "Revenue Structure, Fiscal Illusion, and Budgetary Choice." *Public Choice* 25 (1): 45–61.
- Wagner, Richard E. and Warren E. Weber. 1977. "Wagner's law, Fiscal Institutions, and the Growth of Government." *National Tax Journal* 30 (1): 59–68.
- Wagstaff, Joseph V. 1965. "Income Tax Consciousness Under Whitholding." *Southern Economics Journal* 32: 73–80.

Appendix A: Supplemental replications of Berry and Lowery 1987

Table A1 Results of replication of Berry and Lowery 1987 models for capital and government employment

Ind. Variables	DV: Capital Purchases		DV: Civilian Gov't Employment	
	Model 1	Model 2	Model 3	Model 4
Dem. Party Control (t-1)	201*** 80.56 2.495	201*** 81.29 2.473		
Youth Pop. (t-1)	1784 2222 0.803	1838 2264 0.812		
Income (t-1)	-12974 72123 -0.18	-16071 75286 -0.21		
Households (t-1)	31.95* 18.71 1.708	31.85* 18.89 1.686		
Relative Price (t-1)		214.1 1259 0.17	-2.52 1.83 -1.38	-2.93 1.803 -1.62
Purchases (t-1)			-4.41* 2.634 -1.68	
Capital (t-1)				-4.1*** 1.943 -2.11
Intercept	9.048	8.369	0.013	0.032
N	59	59	61	61
R-sq	0.13	0.13	0.08	0.105

Two Tailed Test: *p < 0.1, **p < 0.05, ***p < 0.001.

Values under the coefficients are, first, standard errors and then t-values.

Some variables divided by constants for readability.

Appendix B: Description of variables

Table A2 Summary of variables used in models

Variable Name	Description
Purchases (PURCHASES)	Ratio of non-defense purchases divided by IPD for nondefense purchases to GDP divided by IPD for GDP (Source: BEA)
Transfers (TRANSFERS)	Ratio of transfers divided by IPD for personal consumption to GDP divided by IPD for GDP (Source: BEA)
Democratic Control (PARTY)	$([PARTYNAT]/2)+C/2$) where C is number of non-southern democratic governors divided by total number of governors
Young Pop (YOUNG)	Percent population less than 18 yrs of age (Source: US Census)
Personal Income (INCOME)	Total personal income in billions of dollars/IPD for national income (Source: BEA)
Households (HOUSEHD)	No. of households (source: US Census)
Relative Price (RELPRICE)	IPD for government purchases divide by IPD for GDP (Source: BEA)
Civ Gov't Employment (CIVGOVEM)	No. of civilian government employees (Source: BEA)
Debt (DEBT)	Fed/State/Local expenditures minus receipts as a percentage of total expenditures (Source: BEA)
Taxes Withheld (WHELD)	Government receipts from income taxes as a percentage of total tax receipts (Source: BEA)
Complexity (COMPLEX)	Herfindahl Index of Revenue Concentration
Rev. Centralization (REVCEN)	Federal receipts as a percentage of total receipts less grants-in-aid (Source: BEA)
Aid (AID)	Federal grants in aid as a percentage of total fed/state/local expenditures (Source: BEA)
Unemployment (UNEMPL)	Unemployment Rate (Source: BLS)
National Party (PARTYNAT)	$([H/4] + [S/4] + [P/2])$ where H/S/P are dummies for Dem control of the House/Senate/Presidency
No. Elections (NUMELEC)	No. of presidential elections since 1948
Veteran Pop. (VETPOP)	Percent of the 20+ population who are veterans (Source: US Census)
Senior Pop. (OLDPOP)	Percent of the 20+ population who is 60+ (Source: US Census)
Poor Pop. (POORPOP)	Percent of the 20+ population below the poverty line (Source: US Census)
Democrat Elections (DEMELEC)	No. of presidential elections featuring Democratic wins since 1948
Republican Elections (REPELEC)	No. of presidential elections featuring Republican wins since 1948
Election Year (ELECTION)	Dummy variable indicating whether the year features a presidential election
Veteran Vote-share (VETVOT)	Veterans as percent of the voting population (Source: US Census)
Farmer Vote-share (FARMVOT)	Farmers as percent of the voting population (Source: US Census)
Senior Vote-share (OLDVOT)	Seniors (60+) as percent of the voting population (Source: US Census)
Poor Vote-share (POORVOT)	Poor (below poverty line) as percent of the voting population (Source: US Census)