Punctuated Equilibria in the Private Sector and the Stability of Market Systems

Derek A. Epp

The article examines longitudinal trends in expenditures by over 1,200 private firms, finding evidence of punctuated equilibrium—a pattern of change widely interpreted as evidence of stick-slip dynamics in decision-making processes. Levels of punctuation in the private sector closely resemble those observed in studies on public budgeting, suggesting that the private sector is not on average any less resistant to change than government. Both private- and public-sector decision making is a function of deliberative processes, which the article compares to market systems. Deliberative decision making takes place when a group comes to a consensus about the allocation of resources. Market processes aggregate the actions of many independent decision makers to arrive at an outcome, such as the value of a commodity. The article considers the relative informational efficiency of these two processes and concludes that market systems should be more adaptive to incoming information. Three case studies provide natural experiments to investigate the stability of outputs during periods of deliberative and market control. A key finding is that when outputs are determined by market systems it greatly reduces the magnitude of punctuation.

KEY WORDS: private sector, punctuation equilibrium, market efficiency, policy change

Introduction

The idea that the public sector is less efficient than private firms and that society would benefit if government could operate more like a business, or better yet if public obligations were transferred to commercial entities through privatization, is long enduring in American politics. Axiomatic to the political right, scholarship has offered conceptual support for the idea, pointing to an absence of clear goals and property rights in the public arena as major causes of inefficiency (Alchian & Demsetz, 1972; Davies, 1971, 1977; Demsetz, 1967; Derthick, 1990; Moe, 1997). However, attempts to measure disparities across the public–private divide have reported conflicting results, with a series of articles finding negligible differences between corporate and government efficacy assessed over a range of indicators (Baldwin, 1990; Bozeman & Loveless, 1987; Haas, Hall, & Johnson, 1966; Lan & Rainey, 1992; Pugh, Hickson, & Hinings, 1969; Rainey, 1983; Rainey & Bozeman, 2000; Simon, 1995), or
even giving an edge to government (Brewer & Brewer, 2011; Camilleri & O'Callaghan, 1998; Mohan & Ray, 2004).

I argue that the public–private comparison is a false dichotomy. That in fact, negligible differences are exactly what can be expected from this comparison. Decisions in both sectors are made through deliberation, which takes place when an individual or group comes to a consensus about the allocation of resources. Rather than comparing across sectors, the article juxtaposes decision processes that can be considered deliberative, grouping together governments and firms, and those that are market based. Private firms are individual commercial entities that sell goods or services to earn a profit. They may be compositional elements of a larger market system, but like governments they establish priorities according to internal organizational structures that require deliberation from at least one decision maker. Markets are very different in that outputs are determined automatically by the interactive behavior of many independent actors. Many of the frictions that make deliberative processes resistant to change are less prevalent in market systems, where transaction costs tend to be low and where aggregation gain improves the overall informational capacity of the system. If the concern is that government is inefficient, then debates over privatization are misplaced and instead policymakers might focus on mechanisms to base policy outputs more directly on market inputs. Privatization can in some circumstances be a means to this end, but it is far from an exhaustive one as subsequent analysis will demonstrate. Government policymaking can circumvent the private sector to engage directly with market systems. In sum, the conventional public–private contrast is a poor arbitrator of organizational efficiency. I will show that a process-based dichotomy is more important and that this operates within both public and private organizations.

Advances in policy studies provide new leverage on the old and unsettled public versus private debate by offering fresh perspectives on what it means for an organization to operate efficiently. I refer here to the punctuated equilibrium (PE) framework, which emphasizes informational efficiency: the ability of organizations to allocate attention proportionally and independently across issues, rather than in a disjointed or episodic fashion. Introduced by Baumgartner and Jones in 1993 and refined in a later collaborative work (Jones & Baumgartner, 2005), the idea is that various institutional and cognitive frictions—such as those caused by multiple veto points, supermajority voting rules, and bounded rationality—prevent governments from responding smoothly to new information and instead policymaking lurches from one crisis to the next; what they refer to as “stick-slip” dynamics. Assessing the full distribution of policy changes, Baumgartner and Jones postulated that we should expect great stability interspersed with occasional punctuation, as policymakers alternate between ignoring problems and overreacting to them. Twenty years of empirical research has supported this hypothesis: distributions of percentage changes in government outputs show high kurtosis, characterized by high central peaks (indicating a process where change is most often incremental), weak shoulders (indicating a lack of moderate changes), and extremely wide tails (caused by the dramatic reprioritization of problems).

A basic corollary of PE theory is that there is a dynamic relationship between information processing and the shape of change distributions such that increasing
informational efficiency should be associated with fewer punctuations, as policymakers attend more proportionally to incoming information. Again scholarship is supportive, finding lower kurtosis in distributions of outputs from systems operating with fewer frictions (Jones, Sulkin, & Larsen, 2003; Baumgartner et al., 2009). The argument advanced in this article is that many of the frictions Baumgartner and Jones identify as making governments resistant to change should apply equally to private firms, but less so to market processes. Expectations then are as follows: that distributions of changes in outputs from deliberative processes—within either governments or firms—will show similar levels of kurtosis, but moving from a deliberative to a market process should be associated with a substantial reduction in kurtosis.

Empirical analysis is in two parts. The first uses longitudinal spending data from over 1,000 institutions of higher learning to compare patterns of change in expenditures by public and private schools. Distributional analysis indicates that private schools show higher levels of kurtosis than their public counterparts, suggesting that far from being limited to public institutions stick-slip dynamics may sometimes be more pronounced in the private sector. This analysis is followed by a broad look at corporate expenditures, where change distributions are drawn for over 1,200 publicly traded firms. While there is considerable variance, median kurtosis values for corporate distributions are very similar to what is typically found when looking at public budgets. The second component of the analysis is three case studies that take advantage of natural experiments to compare deliberative and market processes within single issue areas. The studies look at currency exchange rates, the Regional Greenhouse Gas Initiative (RGGI), and airline deregulation. In each cases, outputs—currency values, carbon emissions, and the price of airfares—transition from being determined by a single deliberative organization to a marketplace. Where comparison between public and private outputs reveals only marginal differences, here they are clear and pronounced: In each case, market processes show lower kurtosis than deliberative ones, indicating that they are less susceptible (although not immune) to the dynamics identified in the literature on policy punctuations.

These findings appear substantively important, offering a solution to the longstanding question: Is the private sector more efficient than government? When it comes to informational efficiency the answer is no. Private outputs show the same pattern of change that decades of policy scholarships identify as indicative of disproportionate information processing. Instead, the article directs attention to an important process-based distinction, showing that outputs appear smoother and less punctuated when they are determined by the automated aggregation of many independent inputs. Furthermore, the article offers a meaningful update to PE scholarship. The results of 20 years of distributional analyses consistently demonstrate that policy change is highly punctuated. (A 2009 article by Jones and colleagues entitled “A General Empirical Law of Public Budgets” reflects the widespread applicability of these findings.) Findings presented here should tamper any expectations that policy instabilities will be pronounced and inevitable. I document cases where, with market systems in place, policy outputs change smoothly over time. These processes are not particularly rare within government and relatively common taking a broad
view of human enterprise. The findings do not cast doubt on previous scholarship. To the contrary, they support the theoretical framework by showing fewer punctuations from processes operating with fewer frictions, but they do serve to illustrate the lower bounds of the PE finding, demonstrating that large and important areas of policymaking are not prone to instability.

**Background**

Jones and Baumgartner (2005) identify four frictions that they argue make governments resistant to change: decision costs, transaction costs, information costs, and cognitive costs. Taken in turn, decision costs refer to the time and energy that is spent bargaining, deliberating, and compromising over a course of action. Transaction costs are the institutional rules and structures that govern how decisions get made. For example, the requirement in bicameral legislatures that both chambers pass identical bills imposes a steep transaction cost, as does the filibuster and executive veto. Information costs are the price of staying informed. Decision makers must be aware of problems—their size and scope—before they can work toward solving them. Finally, Jones and Baumgartner identify cognitive costs as the most substantial. People can be rational in their pursuit of goals, but the complexity of even relatively simple decisions quickly overwhelms their capacity for information processing and rather than considering all of the information relevant to a particular decision, people weigh only a few key factors and then make their best judgment (Jones, 1994, 1999, 2001; Miller, 1956; Simon, 1947, 1999). Going forward, the question is the extent to which each of these frictions apply to corporate decision making and market processes.

**Distributional Assessments of Organizational Response**

Frictions limit an organization’s capacity to process and respond to information. The federal government, for example, ignores most issues most of the time, placing programs on budgetary autopilot while attention is directed elsewhere. Occasionally, however, issues will cross some threshold of urgency and gain attention. When this happens it can prompt a positive feedback cycle where policymakers react rapidly to resolve the perceived crisis until a new equilibrium is established. These dynamics have macrolevel implications, playing out across entire government agendas and long periods of time. Thus, the entire distribution of values is of theoretic interest in the PE tradition. The idea being that a proportional adjustment model implies a Gaussian distribution for first differences (Padgett, 1980), while the PE model suggests a fat-tailed distribution with high central peaks and weak shoulders, consistent with a process where policy adjustments follow the disjointed allocation of attention (Breunig & Jones, 2011; Jones & Baumgartner, 2005).¹

In this way, the shape of change distributions speaks to organizational response: higher kurtosis being associated with a greater resistance to change. This is informational efficiency. Organizations that allocate attention evenly across incoming information are efficient. Organizations that allocate attention disproportionately are
inefficient. Of course, this is only one way to operationalize efficiency, but it is an important one for two reasons. First, information processing is a necessary first step before other types of efficiency can be achieved. That is, before delivering a good or service economically, an organization must be able to adequately assess demand for that product, rather than ignoring demand until it builds to a matter of urgency. Second, an information processing approach encourages broad assessments of organizational response. Instead of focusing on one, many, or even a great deal of indicators, it allows researchers to make comprehensive assessments about the efficiency with which an organization operates.

A distributional approach is employed in numerous policy studies (Baumgartner et al., 2009; Boydstun, 2013; Breunig & Koski, 2006; Jones et al., 2003, 2009; Jordan, 2006; Robinson, 2004, 2013; Robinson, Caver, Meier, & O’Toole, 2007) and this scholarship often focuses on kurtosis, the fourth moment of the distribution, as the most relevant summary measure of a distribution’s shape.\(^2\) Kurtosis measures the “peakness” of a distribution, with higher values indicating leptokurtosis and lower values platykurtosis. However, as estimates of kurtosis are sensitive to outliers, it is standard to measure kurtosis based on L-moments, which is robust to this issue (Hosking, 1998). L-kurtosis ranges from 0 to 1, with increasing values indicating greater leptokurtosis. The Gaussian distribution has an L-kurtosis of 0.123 and the general interpretation has been that output distributions with significantly higher L-kurtosis are indicative of PE processes.

This is the empirical framework that guides the current analysis. If firms are more informationally efficient than governments, we can expect distributions of corporate outputs to have relatively lower L-kurtosis, and the same is true of market processes. Subsequent case studies are selected to allow comparisons across these different conditions within single issue domains.

**Hypotheses**

Deliberative decision making takes place when an individual or group comes to an agreement about the allocation of resources. People, for example, decide how they will allocate their time throughout the day and doing so involves mentally complex weighting of various options, preferences, and desired outcomes. Governments must similarly organize their attention, but where individuals do this internally policymakers must compromise with each other, working within a system of strict rules and behavioral norms.

Private firms also decide how to allocate their resources through deliberative processes and like governments these decisions are made within hierarchical, bureaucratic organizations. Conceptually, the decision making of firms and governments are similar: both must contend with decision, transaction, information, and cognitive costs. Of course, there is tremendous variance across firms in the business ventures they undertake. Some operate in relatively simple economic sectors, especially compared with the complex issues occupying national governments and this might facilitate the gathering and processing of information on the part of firms. (This is a major component of transaction cost economics, which argues that governments are less
efficient than firms, not because of any managerial or bureaucratic deficiencies, but rather because governments are tasked with solving more difficult problems [North, 1990; Williamson, 1999].) Furthermore, we might expect firms to be better equipped to base decisions on market inputs, such as prices and consumer demand, given that their goal of making a profit is relatively straightforward. Still other firms may have corporate structures that minimize transaction or decision costs, allowing executives broad latitude to take action unilaterally, for example.

Governments however are similarly diverse. We can expect governance of a small township to be associated with fewer information and decision costs than state or national-level governance, given relatively fewer issue concerns and decision makers at the local level. Certain policy domains have relatively simple goals and, as subsequent case studies will demonstrate, policy outputs can be based on market inputs. Finally, not all governments are equally democratic. Like firms, some concentrate decision-making authority in the hands of only a few executives. In all, there is great diversity across firms and governments in the organizational structures they employ and the arenas in which they operate. This works against the idea that there will be intrinsic differences that favor private enterprise.

A common limitation shared by both sectors is that within deliberative processes minimizing one type of friction will often create trade-offs in other areas. For example, an organization or individual might determine that to optimize their decisions, they should gather and consider as much information as possible. This, however, might increase decision costs, as information may point in conflicting directions, or because the bureaucratic structures created to gather information invite participation from people with opposing goals. Conversely, concentrating power in the hands of only a few executive decision makers may greatly reduce decision costs, but comes at the expense of a rich information-gathering process. The challenge then is to reduce one type of friction without increasing another. Some firms and governments may be better at this than others or operate in relatively simple arenas, but from a broad, process-based perspective, both entities face comparable frictions and are forced to make trade-offs between them. Our first hypothesis is as follows:

Hypothesis 1: Distributions of percentage changes in corporate and government outputs will show similar levels of L-kurtosis.

Deliberative decision making—by individuals, governments, or firms—can be contrasted with market processes, which minimize each of the frictions Jones and Baumgartner identify. Markets aggregate the actions of many independent decision makers to arrive at an outcome, such as the value of a commodity. The relative efficiency of this type of process is well known and often expressed in terms of the “efficient-market hypothesis,” which asserts that it is almost impossible to consistently beat average market returns because prices on traded assets are a random walk through time, meaning that they are unpredictable and already reflect virtually all the information relevant to buying or selling (Fama, 1970; Graham & Dodd, 1965; Malkiel, 1973; Samuelson, 1965). Each individual actor in a marketplace has an effect on the final outcome, so idiosyncratic or random behavior by actors who are uninformed averages out, leaving a clear, sophisticated signal from the actors who are
reacting to some common informational stimuli. Thus, information and cognitive costs are minimized. Furthermore, because markets are often decentralized, operating independent of bureaucratic structures, they greatly reduce transaction costs. Decision costs are eliminated altogether.

This does not mean markets are infallible as the overall informational capacity of the system cannot exceed the sum of the parts. This may be particularly problematic in cases where there are only a few participants, or where all the participants are poorly informed. There is also debate over the degree to which such processes can be considered efficient if people are themselves boundedly rational. There is evidence that a “herd-mentality” or “irrational exuberance” occasionally leads to speculative economic bubbles (Basu, 1977; Shiller, 2000), just as governments sometimes overinvest in a policy response (Jones, Thomas, & Wolfe, 2014; McCarty, Poole, Romer, & Rosenthal, 2010). Consistent with these cognitive limitations, studies question the degree to which market prices are truly a random walk, identifying short-term patterns that afford modest predictive power (Grossman & Stiglitz, 1980; Lo & MacKinlay, 1999; Lo, Mamaysky, & Wang, 2000). A still greater limitation is that markets are not universally applicable—many decisions can only be reached through deliberation. For example, identifying and prioritizing problems is an important function of both governments and firms that cannot be easily addressed through a marketplace. So, such processes may be useful only after decision makers have determined that action in a particular area is necessary.

Given these various limitations, the expectation is not that market systems will be frictionless and thus lead to normally distributed outputs. Rather, the idea is simply that they will be more efficient than deliberative processes because they minimize (but do not necessarily eliminate) frictions associated with decision making. Hypothesis 2 postulates:

Hypothesis 2: The L-kurtosis of distributions drawn from deliberative decision-making processes will be higher than those stemming from market processes.

Deliberative Processes

Higher education is an area with many public and private sector participants, making it an ideal candidate for case study. The challenges of running a college or university are similar whether the school is a public entity or privately operated—both make decisions about staffing, student admissions, housing, building maintenance and construction, and the allocation of resources across academic departments and athletic programs. I compare expenditures by public, private not-for-profit, and private for-profit schools. If organizational structures within private institutions make them less resistant to change, allowing them to better anticipate demands and trends in higher education and respond rapidly, then distributions for both types of private school should have lower L-kurtosis than the distribution for public schools. If the relatively straightforward goal of making a profit provides firms with a comparative advantage, then the distribution for private for-profit schools should have lower L-kurtosis than the distributions for public and private not-for-profit schools.
In summary, if firms operate with fewer frictions than the public sector, we should anticipate the highest L-kurtosis for public schools, lower L-kurtosis for private not-for-profit, and still lower for private for-profit schools.³

Expenditure data are available from the National Center for Education Statistics (NCES), a federal entity within the Department of Education that collects data related to education. Every college and university operating in the United States reports annual financial data to the NCES, which maintains records from 1987 to 2010 for 10 expenditure categories: instruction, research, public service, academic support, student services, institutional support, operation and maintenance, auxiliary services, hospital services, and independent operations. To facilitate comparison, the case study is limited to 4-year institutions that grant bachelor degrees. Altogether there are 373,960 observations across 487 public, 1,138 private not-for-profit, and 73 private for-profit institutions.

The first step is to calculate annual percentage change values for each institution across each expenditure category.⁴ For example, if an institution spent $1 million on student services in one year and $2 million in the following year, then the percentage change observation for student services in that year and that institution is 100 percent. Figure 1 pools these observations, displaying the percentage change distribution for all public institutions in the upper-left panel, private not-for-profit in the upper right, and private for-profit in the lower left. The range of the axes is held constant to highlight the differences across distributions.
In each case, the distributions can be described as leptokurtic and the dashed-line Gaussian distributions included as reference emphasize the distinction. Assessed collectively, public institutions have an L-kurtosis of 0.674, compared with 0.732 for private not-for-profit, and 0.873 for private for-profit schools. The difference between public and private not-for-profit institutions is only marginal, but if anything suggests that private institutions are more susceptible to stick-slip dynamics than public ones. This is reinforced by the distribution for private for-profit schools, which has a substantially higher L-kurtosis. These results are exactly the opposite of what we would expect if private institutions are less resistant to change, but consistent with the argument made here that the frictions acting on public and private institutions are approximately equivalent.

I also generate a change distribution for each institution in the dataset, a total of 1,698. Each institution is linked to 10 expenditure categories over 23 years, so each school-level distribution is drawn from approximately 230 observations, although some schools do not accrue expenses across all 10 categories and these have fewer observations. The lower-right quadrant of Figure 1 displays box plots for each type of school, summarizing the L-kurtosis observed across all the schools of that type. The tails of the box show the upper and lower adjacent values, the center-line the median L-kurtosis value, and the edges of the box the 25th and 75th percentiles. The values in parentheses are the number of schools of that type included in the summary statistics.

Clearly, there is considerable variance in leptokurtosis across institutions of higher learning and with 1,698 institutions going into the analysis this variance is not surprising. More telling are the median values: 0.421 for public schools, 0.417 for private not-for-profit, and 0.560 for private for-profit schools. The Wilcoxon rank-sum test (Wilcoxon, 1945) indicates that the difference between the medians for public and private not-for-profit schools is not statistically significant, but that the median for private for-profit schools is statistically different than the other two. In all, the results of the school-level analysis mirror the evidence provided by the pooled distributions in Panels A through C. The difference in L-kurtosis between public and not-for-profit private schools is negligible, but private for-profit schools are associated with greater punctuation in outputs. This runs counter to the traditional logic regarding public-private distinctions, which suggests that for-profit institutions operate with fewer frictions because they have clearer goals than their public counterparts and therefore should be more responsive to incoming information. Instead, when it comes to higher education, it is the for-profit institutions that show the greatest instability in outputs.

Expenditures by Publicly Traded Firms

For a broader investigation of decision making in corporate settings, I use the Compustat database (maintained by the University of Pennsylvania’s Wharton Business School) and assemble expenditure data for 1,147 companies listed on the Japanese Nikkei Index, the Brazilian Bovespa, the Australian All Ordinary Index, and the German Deutsche Boerse (DAX) from 1987 to 2013, the entire period of data availability. PE scholarship has looked at the public expenditures of a great many local
and national governments. The logic of collecting such a wide range of corporate data is to facilitate a similarly global assessment, rather than focusing on only the companies from one particular region, which might be subject to regulations or economic idiosyncrasies that would systematically affect expenditure decisions. Compu-stat provides information on 13 different expenditure categories such as spending on research and development, advertising, wages, and the cost of goods sold. The longitudinal data make it possible to calculate change distributions for each company and Figure 2 summarizes the L-kurtosis of these distributions by stock index.5

Once again there is considerable variance in leptokurtosis and the expenditures of some firms appear to be normally distributed. Further exploring the causes of this variance—both across firms and stock indices—would make for an important research question. Perhaps firms that can base their decisions more directly on market inputs see fewer punctuations in outputs. If true, the broad perspective Figure 2 provides suggests that this is not occurring systematically across the private sector. Some firms show very high levels of L-kurtosis and median values range from 0.375 for companies on the Nikkei Index to almost 0.800 for companies listed on the DAX. In “A General Empirical Law of Public Budgets,” Jones et al. (2009) assess change distributions for seven national governments and find L-kurtosis values ranging from 0.379 to 0.611. Here, the scope of the analysis is much greater—distributions are generated for over 1,000 firms—but median L-kurtosis values are very similar.6 This, along with the case study on higher education, provides strong support for hypothesis 1: decision making in the private and public sectors displays an equal tendency toward punctuations in outputs.

**Market Processes**

The relative efficiency of markets has been noted in PE studies. Jones et al. (2003) showed that distributions of changes in stock returns for the S&P 500 were
approximately normal, which they contrasted with distributions of government outputs that showed high levels of punctuation. I update and expand on their analysis by generating change distributions for daily returns on the S&P 500, the London Stock Exchange, the Nikkei Exchange, and the Dow-Jones Industrial Average. Table 1 displays the L-kurtosis of each market distribution.

Consistent with the findings of Jones and colleagues, market returns show substantially lower L-kurtosis than government or private-sector outputs. Stock markets aggregate the decisions of many independent investors to establish the values of traded assets. They are the quintessential example of market processes, so the fact that they show lower L-kurtosis than deliberative processes matches theoretical expectations. Table 1 is the point of departure for three case studies that utilize natural experiments to directly compare outputs that are determined by deliberative and market processes, providing a more rigorous test of hypothesis 2. The cases focus on exchange rates, the RGGI, and airline deregulation. Besides facilitating a test of the hypothesis, the cases were selected because they illustrate three different ways that the government can induce stability in outputs through market systems—using them directly in policymaking, encouraging their use in the private sector by establishing mandatory markets, and by relinquishing control over an economic sector to create market competition.

The Politics of Exchange Rates

Establishing currency values is an important component of monetary policy and policymakers can do this through either market or deliberative processes. Countries that use markets allow their currency to fluctuate on international exchanges. In fact, the Foreign Exchange Market is the largest in the world, trading an average of $5.3 trillion each day (Bank for International Settlements, 2013). There are, however, many strategies a country can employ to manipulate the market value of its currency. China artificially lowers the price of the yuan by buying large quantities of U.S. dollars and aggressively selling its own currency. This lowers the price of Chinese exports, undercutting their international competitors. Objections to this type of manipulation are widespread. The United States maintains that it perpetuates a global trade imbalance by making it difficult for U.S. manufactures to gain a foothold in domestic and international markets. A more sweeping concern is that China’s approach is bad monetary policy and that eventually their economy will suffer for it, leading to a downturn with global repercussions.

China is a blatant case, but currency manipulation can take many more subtle forms. The degree to which a country manipulates its currency is best thought of as

<table>
<thead>
<tr>
<th>Market</th>
<th>Observations</th>
<th>Years</th>
<th>L-Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;P 500</td>
<td>12,547</td>
<td>1950–2013</td>
<td>0.242</td>
</tr>
<tr>
<td>London Stock Exchange</td>
<td>2,586</td>
<td>2001–2013</td>
<td>0.312</td>
</tr>
<tr>
<td>Nikkei Exchange</td>
<td>5,699</td>
<td>1984–2013</td>
<td>0.227</td>
</tr>
<tr>
<td>Dow–Jones Industrial Average</td>
<td>22,165</td>
<td>1900–2013</td>
<td>0.253</td>
</tr>
</tbody>
</table>
a scale, ranging from the most flexible or freely traded currencies, to the least flexible, tightly controlled currencies. For simplicity, the currencies can be grouped into three general categories: free floater, floater, and manipulated (International Monetary Fund [IMF], 2012). Countries with free-floating currencies allow their currency to fluctuate according to the whims of the international market, while countries with manipulated currencies pursue strategies to artificially hold their currency at some specific predetermined level.

This framework provides a natural experiment to compare market and deliberative processes. The expectation is that because changes in the value of free-floating currencies are determined by markets, they will be relatively stable over time, with L-kurtosis values approximating those observed from other market distributions (see Table 1). Conversely, the value of manipulated currencies is determined by the deliberations of a central government and should therefore be highly punctuated. Currencies that the IMF classifies as floaters should fall between these extremes.

Using historical exchange rate data for 40 countries, available through the World Bank website, I test these expectations. For each country, the average exchange rate relative to the U.S. dollar is tracked on a monthly basis, from 1994 through 2013. Of the 40 currencies, 18 are classified by the IMF as manipulated, 15 as floating, and 7 as free floating. Figure 3 shows the change distributions associated with each category, with the range of the y-axis held constant to facilitate comparison. Note that
the range of the x-axis decreases considerably moving from the manipulated to free-floating category.

The distribution for manipulated currencies has an L-kurtosis of 0.606, floating currencies have an L-kurtosis of 0.429, and free floating 0.198. These statistics indicate substantively important differences in the likelihood of a currency undergoing punctuations in value. The trend meets theoretical expectations. When currency values are determined by markets, the resulting distribution is almost Gaussian, but when policymakers set currency values through deliberation, changes appear erratic, and punctuations occur frequently. Policymakers can choose to set exchange rates through either deliberative or market mechanisms and this choice has profound consequences for the stability of currency values over time.

**The Regional Greenhouse Gas Initiative**

Another comparison can be found with the RGGI, which creates a marketplace for utility companies to buy and sell carbon credits within nine northeastern states. The goal behind the RGGI is to reduce carbon dioxide emissions as part of an effort to slow global warming. Under the initiative, carbon emissions are paid for through the purchase of emission permits that are auctioned on a quarterly basis by the participating state governments. Over time, the idea is to decrease the total number of permits available for auction, thus reducing carbon emissions, with the overall goal of reducing emissions to 10 percent below their 1990 level.

Tracking carbon emissions over time is obviously important for the RGGI as a means to assess progress toward carbon reductions. The initiative provides data on the quarterly emissions of each carbon-emitting power plant from the nine participating states from 2000 through 2008, before the auctions began, and then from 2009 to 2013, once the market system was in place. Altogether, 230 plants across the nine states are represented in the data.

This setting provides an opportunity to compare outputs before and after the introduction of a market system. Before the RGGI the amount of carbon each power plant emitted was a function of a deliberative process—decision makers within each firm determined how much energy to produce. Obviously, economic considerations would affect the amount of carbon each power plant could generate on an annual basis, but the decision making that governed carbon emissions was centralized within each power company. Once the RGGI was in place, carbon emissions had an independent cost determined by market forces. Deliberative decision making still played a role as clearly companies decided how many permits to buy, but the final output (carbon emissions) was based directly on the price of carbon, a market input.

Figure 4 shows the distribution of annual changes in carbon dioxide emissions by each power plant from 2000 to 2008 in the left panel and the distribution of changes from 2009 to 2013, after the RGGI was in place, on the right. Again, the ranges of the axes are held constant to aid comparisons. Both distributions are leptokurtic, indicating that even with the RGGI in place annual carbon emissions are subject to dramatic upheavals. As discussed, markets are not entirely free of friction and in this case rather
than looking at the actual price of carbon permits (analog to what previous case study did for currency), the focus is on a closely related output. That is, the case study is one step removed from the actual marketplace, so it is not surprising that leptokurtosis is still relatively high after 2009. Most important is the dynamic from one period to the next. Before the RGGI, when carbon emissions varied according to individual corporate decision making, the L-kurtosis was 0.729. After the RGGI, when carbon emissions are linked more directly to a market output, the L-kurtosis falls to 0.426.

The RGGI case shows how markets can induce stability beyond monetary returns; in this case, affecting the rate of carbon emissions. It also illustrates a second way that markets can be incorporated into policymaking. By establishing and then mandating that utility companies participate in a market for carbon permits, state governments brought about greater stability in outputs (while also reducing greenhouse gas emissions).

Airline Deregulation

The first case study looked at how policymakers can use markets within government and the second showed how policymakers can establish these systems in the private sector. The final case study reveals a third avenue by which policymakers can accommodate market systems—deregulation. Prior to 1978, the federal Civil Aeronautics Board (CAB) regulated airline fares, routes, and schedules, treating the airline industry as a public utility. As the industry grew, travelers protested the lack of competition and subsequently high ticket prices and inconvenient routes. These complaints culminated with the passage of the Airline Deregulation Act in 1978, which quickly phased out the CAB’s ability to set fares and eventually eliminated the department altogether. This presents another opportunity for case study. Before deregulation airline fares were a matter deliberative decision making; after deregulation they were subject to market demands.

Historic data on actual ticket prices is unavailable, so instead I use a measure of the airline industry’s total “yield,” available from 1948 to 2012. Yield refers to the
revenue per passenger mile earned by the industry. For example, if the airline industry earned $10 million in revenue in a year and produced one hundred million passenger miles (the total number of miles each airline seat traveled), then the industry’s yield is ten million divided by one hundred million, or 10 cents per mile. Yield is essentially the value of an airline seat to the industry, so it serves as a reasonable substitute for ticket prices. Figure 5 compares the distributions of annual changes in airline yield before deregulation in the left panel and after deregulation on the right.

Once again, outputs stabilize after moving to a market system. When the airline industry was regulated by the CAB, the change distribution had an L-kurtosis of 0.425. After deregulation, L-kurtosis falls to 0.235. Holding the range of the axes on both figures constant highlights the transformation from one period to the next. The caveat to this study is that yield is only publicly available as an industry total, instead of an airline-by-airline basis. As such, the total number of observations is relatively low, justifying some caution in the interpretation of the results. But, the pattern at this point is well established. Each case study has shown a substantial drop in L-kurtosis when outputs are subject to a marketplace rather than a deliberative process, offering strong support for the second hypothesis. Furthermore, the cases demonstrate the diverse applications of market systems within policymaking and only the third avenue involves the exit of the public sector. Clearly then, markets are not the exclusive purview of the private sector. Governments can use them either directly to set policy or indirectly by mandating their use from commercial entities.

Conclusion

I have argued that private firms and governments share similar frictions because decision making in both cases is deliberative and a function of bureaucratic organizations. Empirical evidence points strongly in this direction. Distributions of changes in expenditures by private firms closely resemble distributions of changes in government outputs, with similar fat tails and high central peaks. The implication is that decades of political rhetoric about the relative efficiency of the private sector is
overstated, conflating firms with markets. Companies may be publicly traded and thus components of a larger market systems, but firms and markets operate according to fundamentally distinct processes. Firms face equal barriers to change as governments and appear no better at surmounting these obstacles.

However, while privatization is not an answer to policy instabilities, the findings presented here offer a cautionary tale to expectations that these instabilities will be pronounced and inevitable. I document cases where, with market processes in place, outputs changed only gradually with time—conditions that are not particularly rare within government and relatively common taking a broad view of human enterprise. These findings are not hostile to previous scholarship. Markets themselves are not perfectly efficient (notably, none of the distributions examined here were perfectly Gaussian) and frictions in market processes can be attributed to the same basic cognitive limitations that are cited in PE theory. Still, the article provides an important update to policy studies, offering a counterpoint to the abundance of evidence in the literature depicting change as highly punctuated. This is not always the case and substantively important areas of policymaking are not particularly unstable. Furthermore, governments exercise broad latitude in bringing markets to bear in the policymaking process, as the three case studies illustrated. Of course, not all issues can be solved with a marketplace. Searching for and prioritizing problems is an important function of government that can be achieved through only deliberation. But, there is no reason to think that private firms will necessarily be any better at this deliberation than governments. The evidence suggests that decision processes matter more for the stability of outputs than the institutional venue where the decisions are made.

Derek A. Epp is a graduate student in the Political Science Department at the University of North Carolina at Chapel Hill.

Notes

1. Padgett’s (1980) insight was that the incremental model of budgeting implied a proportional weighting of inputs. Assuming that the inputs are stochastic and independent, annual adjustments based an accumulation of these inputs would be a random walk through time and taking the first difference of these values would result in a Gaussian distribution. This proportional adjustment model contrasts with the PE model, which argues that frictions lead to a disproportionate weighting of inputs—most are ignored, but some elicit overreaction.

2. Padgett (1980) had based his formulation on annual first differences. PE studies focus instead on annual percentage changes, with the assumption that the growth of programs over time should be proportional to their size (in the economics tradition this is known as the Gibrat thesis). Consequently, annual percentage changes—rather than annual dollar changes—should follow a random walk. Studies of public budgeting, however, show that the form of distributions is robust to using first differences or percentage changes (Jones & Baumgartner, 2005).

3. A limitation to the case study is that even for-profit schools may be heavily dependent on government policies, as their business model relies on their customers obtaining federal student aid. However, this situation is not atypical. The fortunes of many for-profit businesses depend on government
spending. For example, Medicare is one of the largest items in the federal budget and goes predominately to private healthcare providers.

4. All amounts are adjusted for inflation to 2010 dollars.

5. This analysis excludes any company with fewer than 60 total observations to avoid drawing a distribution from a limited number of cases.

6. All the firms under consideration are relatively large and publicly traded. As such, they are likely to have more complex interests and bureaucracies than smaller, privately owned businesses. This limitation in scope is because expenditure data are available for only publicly traded firms. Studies on public budgeting have tended to focus on national governments, which are also relatively complex. So, the analysis compares complex firms to complex governments.

7. These data are also available through Compustat and change distributions are drawn from all available years of data.

8. The Appendix considers an alternative explanation for the pattern observed in Figure 3: that countries which manipulate their currency are less stable overall than countries with free-floating currency. A regression predicting the L-kurtosis of exchange rate distributions finds that market structures are a significant predictor, controlling for levels of political stability.

9. These data are available through the Airline Data Project, maintained by the MIT Global Airline Industry Program.

References


**Appendix**

Figure 3 from the case study on exchange rates showed progressively higher L-kurtosis moving from free floating to manipulated currencies. This dynamic was consistent with expectations, but a plausible counterhypothesis is that countries that manipulate their currency tend to be less stable overall than countries with free-floating currencies. In other words, perhaps systematic political instabilities among the manipulating countries would lead to punctuations in exchange rates even in a market context.

To address this possibility, I model L-kurtosis as a function of both decision making and political stability. The World Bank utilizes a “political stability index” that ranges from −2.5 to 2.5, with negative numbers corresponding to greater instability. Table A1 shows the results of an ordinary least squares (OLS) regression predicting the L-kurtosis of exchange rate distributions, calculated separately for each of the 40 countries. Two independent variables are included.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market flexibility</td>
<td>−0.08*</td>
<td>0.03</td>
</tr>
<tr>
<td>Mean political stability</td>
<td>−0.06*</td>
<td>0.02</td>
</tr>
<tr>
<td>Constant</td>
<td>0.49*</td>
<td>0.07</td>
</tr>
</tbody>
</table>

*N* = 40.

Adjusted R-squared = 0.226.

* = significant at 0.05 *p*-value.
One is the average political stability index score for each country from 1994 through 2012. The other is a categorical variable corresponding to the market flexibility categories, with a 1 indicating that the currency is manipulated and a 3 that it is free floating.

Both independent variables are negative and statistically significant, indicating that punctuation in currency values decreases relative to political stability and free markets. Figure A1 shows the predicted marginal effects of political stability on L-kurtosis across each currency type. Countries that have free-floating currencies tend to be political stable and rarely see punctuations in the value of their currency. Differences in L-kurtosis appear relatively minor between manipulated and floating currencies. It is the free-floating currencies that are clearly distinct, with much lower L-kurtosis values. In all, the results support the interpretation from the main text. Market flexibility appears to have an important role in explaining currency punctuations, even controlling for possible rival explanations.

Figure A1. Marginal Effects of Political Stability on L-kurtosis Across Three Types of Currency.