Anomalies
The Flypaper Effect

James R. Hines, Jr., and Richard H. Thaler

Economics can be distinguished from other social sciences by the belief that most (all?) behavior can be explained by assuming that rational agents with stable, well-defined preferences interact in markets that (eventually) clear. An empirical result qualifies as an anomaly if it is difficult to “rationalize” or if implausible assumptions are necessary to explain it within the paradigm. Suggestions for future topics should be sent to Richard Thaler, c/o Journal of Economic Perspectives, Graduate School of Business, University of Chicago, Chicago, IL 60637, or richard.thaler@gsb.uchicago.edu.

Introduction

The 104th Congress is considering shifting federal revenues to the states. This is not the first Congress to contemplate such a step. In 1835, Congress undertook the country’s first experiment with revenue sharing, albeit under circumstances that are now rather hard to imagine. The U.S. federal government faced a quaint crisis in which its budget was in surplus (due to receipts from land sales and tariffs), the federal debt was fully paid off, and it was unclear whether the federal government could find additional worthwhile expenditures. To make matters worse, federal surpluses were projected to continue indefinitely. After considerable wrangling, it

---

James R. Hines, Jr., is Associate Professor of Public Policy, John F. Kennedy School of Government, Harvard University, and Faculty Research Fellow, National Bureau of Economic Research, both in Cambridge, Massachusetts. Richard H. Thaler is Professor of Economics and Behavioral Science, Graduate School of Business, University of Chicago, Chicago, Illinois, and Research Associate, National Bureau of Economic Research, Cambridge, Massachusetts.
was decided that the federal government would dispose of the surplus by distributing it to state governments on the basis of population. The politicians of the day took this step with the expectation that state governments would use the distribution to finance additional public works. In his speech to the Senate on Christmas Eve (!), Henry Clay (1843, p. 292) predicted that "With this ample resource, every desirable object of improvement, in every part of our extensive country, may, in due time, be accomplished." 1

This expectation, that state governments will use the grants they receive from the federal government to increase local spending, is inconsistent with simple economic theory. To see why, consider the simplest case, in which residents of the local jurisdiction receive a lump-sum grant, unaccompanied by any significant change in taxes or spending. This grant is the equivalent of an increase in income. The residents of the local jurisdiction should spend this increase in income just like any other increase, and the share devoted to government goods and services should be equivalent to the marginal propensity of local governments to spend out of income: for states this would be on the order of 5–10 cents on the dollar.

Of course, many grants are not of this lump-sum variety. In another common form of grant, the federal government offers to match state-level expenditures at a specified rate, thus creating both income and price effects on the demand for local government services. Yet another important case involves matching grants with a cap. In this scenario there is an income effect, but if the local government would choose to spend more than the amount necessary to reach the maximum government subsidy, there is no substitution effect. Though these cases are more complicated to analyze than unrestricted block grants, it is always possible to derive a theoretical prediction of the effect on spending.

Numerous studies have investigated the actual effect on spending of various types of grants to state and local governments. By and large, these studies tend to support Henry Clay’s prediction: spending is stimulated by much more than theory predicts. For unrestricted block grants, the estimated effects are often closer to 100 percent than to 5 or 10 percent. This result was dubbed the "flypaper effect" by Arthur Okun, since the money that the government sends out "sticks where it hits."

Evidence

The empirical work generally relies on cross-sectional variation in grants received by different states and localities. Taking this variation to be exogenous to state and local spending levels, this work then examines the extent to which addi-

---

1 For additional information, see Bourne (1885), who chronicles with loving detail the impact of the surplus distribution on subsequent state and local expenditures. Massachusetts allocated most of its receipts to town governments; Bourne (p. 147) records that "New Bedford received $18,258.95. The money was 'expended in the erection of a town hall.' The work was economically done, and the surplus was a benefit."
Table 1

Some Estimates of the Flypaper Effect

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample</th>
<th>Change in spending as grant changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inman (1971)</td>
<td>Panel study of 41 city budgets</td>
<td>1.00</td>
</tr>
<tr>
<td>Weicher (1972)</td>
<td>State aid to 106 municipal governments</td>
<td>0.90</td>
</tr>
<tr>
<td>Weicher (1972)</td>
<td>State grants to independent school districts</td>
<td>0.40</td>
</tr>
<tr>
<td>Gramlich and Galper (1973)</td>
<td>Federal grants to local and state governments</td>
<td>0.43</td>
</tr>
<tr>
<td>Gramlich and Galper (1973)</td>
<td>Federal and state aid to 10 large urban</td>
<td>0.25</td>
</tr>
<tr>
<td>Bowman (1974)</td>
<td>Federal education grants to West Virginia school districts</td>
<td>1.06</td>
</tr>
<tr>
<td>Bowman (1974)</td>
<td>State grants to West Virginia school districts</td>
<td>0.50</td>
</tr>
<tr>
<td>Feldstein (1975)</td>
<td>State grants to Massachusetts towns</td>
<td>0.60</td>
</tr>
<tr>
<td>Olmsted, Denzau and Roberts (1993)</td>
<td>Missouri state aid to local school districts</td>
<td>0.58</td>
</tr>
</tbody>
</table>

Tional grant receipts are associated with greater government spending. Gramlich (1977), Inman (1979) and Fisher (1982) survey the earlier flypaper literature, while Wyckoff (1991) offers a more recent treatment. All studies surveyed report some degree of flypaper. The variation comes from whether the estimated flypaper effect is simply large or if it is enormous.

Table 1 lists some of the most commonly cited studies. Although the studies were done with a variety of approaches and data sets, the bottom line is what most concerns us here. The low-end estimates are that a $1 grant increases the spending of the local agency by 25 cents; the high-end estimates are clustered around unity.

Several other recent studies have found and measured flypaper effects in ways that do not fit readily into the format of Table 1. Wyckoff (1991) analyzes state aid to local school districts in Michigan. The Michigan aid formula combines unconditional and closed-ended matching-grant elements, thereby complicating the econometrics but permitting Wyckoff to analyze the importance of various econometric corrections (which are discussed below). The study finds that a Michigan school district receiving a state block grant equal to 1 percent of private income in the district increases its school expenditures by as much as it would had it received no state grants while its private income grew by 11 percent.

Olmsted, Denzau and Roberts (1993), some of whose results appear in Table 1, also document a different type of flypaper effect. They analyze the effect of debt retirements on expenditures by Missouri school districts. When debt issues retire, and a school district no longer needs to make regular interest payments on those issues, does the school district cut taxes, or find a way to spend the money on something new? The authors find that operating budgets expand at the same time that debt issues are retired, leaving tax rates unchanged, which seems to imply flypaper at work.
Ladd (1993) investigates a form of flypaper involving the Tax Reform Act of 1986, which was intended to broaden the tax base while lowering tax rates at the federal level. Since many states use the federal tax code to define income for the purposes of their state income tax, broadening the tax base for federal taxes also broadened the tax bases of these states. Did these states cut tax rates to leave revenue constant? Or slip a hidden tax increase by their taxpayers? Ladd's results indicate that, for every $100 of higher state taxes generated by the changing federal definitions of income in the 1986 Tax Reform Act, state income tax collections rose by $40.2

Finally, Strumpf (1995) offers a sensitive test of the flypaper effect on a sample of Pennsylvania communities that have the option of imposing a 1 percent "earned income tax." Workers must pay the tax to the community where they work, unless the community where they live has such a tax, in which case their tax revenue accrues to their home community. Communities tend to adopt such a tax when the proportion of voters already paying the tax elsewhere becomes high, since these voters can increase their community's revenue at no cost to themselves. Strumpf obtains two interesting findings. First, tax receipts from nonresidents are "stickier": towns have spending elasticities of 0.41 out of tax collections from nonresidents, but only 0.27 out of tax collections from residents. Second, in communities with high levels of local government overhead, the elasticity of local government spending with respect to nonresident tax revenues exceeds unity. Strumpf conjectures that communities whose governments spend large fractions of their budgets on administrative overhead are the ones whose governments are the most likely to deceive voters about the magnitude of local resources.

Explanations

Most attempts to explain the flypaper effect argue that an error was made, either by the economist studying the problem or by the voters in the jurisdictions receiving the aid.

Specification Errors

One possibility is that while it appears that money is sticking where it hits, it isn't really doing so. Instead, the appearance is due to some specification error that researchers keep making.

For example, high-spending states or localities receiving matching grants that include an upper limit typically find themselves beyond the cap of the grant: for them, additional spending does not trigger matching grants, since the grant limit has already been reached. It is common for researchers to treat these situations as

2 Marshall (1991) reports similarly signed but statistically insignificant results in investigating the same phenomenon.
though the governments in question receive unconditional grants, since the price of the public good in question is unaffected at the margin (for example, Gramlich and Galper, 1973; Bowman, 1974). The trouble with such a treatment is that only those governments with high spending propensities will be classified as receiving unconditional grants. The connection between receipt of unconditional grants and higher spending might be based on this (mis)specification of the problem (Lankford, 1987; Megdal, 1987).

Moffitt (1984) offers some evidence that flypaper effects in the AFDC program disappear when the econometrics is treated differently. However, a full treatment of this issue requires maximum likelihood estimation, which in turn relies on untested assumptions about state government objectives. Studies that have employed this approach, such as Wyckoff (1991), find that this correction does not significantly alter the results. Furthermore, this explanation does not apply to studies of unconditional block grants where flypaper is nevertheless observed, as in Inman (1971), Weicher (1972), Gramlich and Galper (1973) and Bowman (1974).

A second type of specification error might arise in the demand function for government expenditures. The median voter’s share of the tax burden in a community may be significantly smaller than the average share; as a consequence, intergovernmental grants may effectively enrich these individuals (Fisher, 1979). If a disproportionate amount of the grant benefits the median voter, and if the median voter determines fiscal outcomes, then the grant may have a larger-than-expected effect on local government spending. However, it is difficult to explain the large estimated flypaper effects with any plausibly sized income effects.

A related argument emphasizes that state and local governments must use distortionary taxes to extract money from private individuals. Since grant money received from other governments creates no deadweight loss for the receiver, this grant money is worth more than equal amounts of income in the hands of private individuals and should have a greater stimulative effect on spending. Once again, while the direction of this effect is correct, the marginal deadweight losses from taxes are typically far too small to reconcile the large differences between propensities to spend out of changes in grants and changes in private incomes.

A third category of specification error concerns the omission of important variables. Hamilton (1983) points out that high-wage and low-wage communities will tend to differ systematically in other characteristics. For example, low-wage communities may need to spend more on police protection to obtain the same protection from robbery. Hence, when one estimates income elasticities of demand for government services, estimated coefficients reflect not only the effect of higher income but also the different population characteristics of communities with different income levels. Hamilton hypothesizes that the estimated effect of intergovernmental grants might be consistent with estimated income effects net of the impact of changing characteristics. But the flypaper effect persists in the presence of better controls for population characteristics.

Another type of omitted variable is the behavior of other governments. Case, Hines and Rosen (1993) examine situations in which states tailor their practices
after the behavior of similarly situated states. For example, a grant program that encourages one state to raise its expenditures might thereby encourage another to raise its spending through emulation, as well as through providing additional resources. But even after explicit treatment of these "copycatting" effects, they find that the estimated spending derivative out of federal grants falls from unity to 0.65, still well above any estimated income effect.

A final specification error could arise from the nature of the government granting process. Chernick (1979) suggests that states and localities may feel the need to maintain high expenditure levels to continue receiving certain types of federal grants that are allocated on a discretionary basis. While this possibility is intriguing for certain examples, it does not address the flypaper effect of truly unconditional grants like federal revenue sharing.

**Individual Confusion**

It is possible that individuals confuse the average and marginal price effects of unconditional grants and that this confusion is responsible for apparent flypaper effects (Courant, Gramlich and Rubinfeld, 1979; Oates, 1979). Unconditional grants reduce the average cost of local government expenditures, without affecting the marginal cost. But if individual voters believe the marginal cost has been reduced, they may react to unconditional grants by demanding significant increases in government expenditures at this new, perceived to be lower, price.

However, this theory implies that certain matching grants can be understood in terms of their perceived price changes—and actual spending patterns do not appear to be consistent with this implication. For example, Wyckoff (1991) presents evidence that Michigan school district spending responds differently to average cost reductions induced by (nonmatching) grants than it does to those induced by changes in after-tax education costs. These effects would be equivalent if voters confused average and marginal costs.

In a somewhat more sinister version of the voter-misperception story, told by Filimon, Romer and Rosenthal (1982), self-interested local bureaucrats prevent voters from learning of intergovernmental grants, thereby affording the bureaucrats the luxury of spending any marginal funds received from higher levels of government. Wyckoff (1991) offers evidence against the strong form of this argument—that bureaucrats get away with spending 100 percent of any marginal grant money—but some form of misperception abetted by local officials may be responsible for part of the stimulatory effect of intergovernmental grants.

**Evaluation**

Where does this leave us? The explanations based on econometric misspecification apply only to certain studies, yet flypaper effects are observed elsewhere. For example, the Ladd results on the Tax Reform Act of 1986, and the Olmsted, Denzau and Roberts study of bond retirements, are not open to these criticisms. Explanations based on individual confusion are more promising, though somewhat incomplete. The next section offers some ideas to fill in the gaps.
Commentary

There is a couple we know, who we will call Harry and Sally. Though now married, at an earlier point in their relationship Harry and Sally had decided to move in together. The plan was to find an apartment and share the rent. Around this time, however, Sally received an inheritance and decided to use the money to buy a condo. They then faced a dilemma: how to share the housing costs. Sally, an economist, argued that Harry should still pay his share of the imputed rental value of the condo, as they had previously agreed. After all, she was under no obligation (as yet) to share the inheritance with Harry, and had she invested the money in a mutual fund instead a condo, their original rent-sharing plan would remain intact. Harry did not agree. He viewed the notion of imputed rental value as another figment of the economic imagination of his beloved. Harry offered to share the out-of-pocket expenses, such as taxes and utilities, but forcefully argued that since their total rental costs were zero, his share was also zero.

Harry and Sally’s dispute illustrates the role of accounting methods in economic analysis. Economists correctly argue that money is fungible. Sally’s argument depends on that premise. Harry’s reaction is typical of non-economists. Out-of-pocket costs are distinguished from opportunity costs, and the location of a pool of funds can easily alter perceptions of what is fair.

Similar issues are important in understanding the flypaper effect. Economists are naturally inclined to attribute anomalous flypaper effects to failures of the political system. However, agency problems between citizens and their representatives do not alone explain flypaper: why is a governor better able to expand the state budget with federal grants than with taxes? And why are reduced grant receipts associated with smaller state budgets?²³

Two behavioral tendencies discussed in earlier installments of this feature may help fill in the puzzle: loss aversion and lack of fungibility (Kahneman, Knetsch and Thaler, 1991; Thaler, 1990). First, assume taxpayers are loss averse, that is, much more sensitive to decreases in their welfare than to increases. This implies that the political cost of explicitly raising a tax is greater than the political benefit of an equivalent tax cut. Second, assume that taxpayers do not treat funds as fungible. We know that changes in housing wealth, pension wealth and future income have very different effects on consumption than equivalent present value changes in current liquid assets or income. So, it should be no great surprise that households violate fungibility in evaluating their political leaders.

These phenomena may help explain why we observe flypaper effects. When a local government receives a grant, it is possible to increase expenditures without raising taxes. The choices to the public are not framed as between spending the money or cutting taxes, but rather how should the money be spent. When a bond

²³ Stine (1994) offers evidence that flypaper effects are more pronounced when grant receipts fall than when they rise.
issue is paid off, though the voters would not approve a tax increase to pay for the
new expenditure, they are willing to accept the program in lieu of the highly im-
plex alternative of cutting taxes. It is a rare community that treats a $2 million
block grant and a collective $2 million federal tax cut as equivalent, regardless of
their underlying equivalence in theory.

If flypaper effects are the product of behavioral phenomena, then they should
appear outside the public sector. In fact, flypaper-like effects can be found in the
private sector as well. For example, Blanchard, López-de-Silanes and Shleifer (1994)
study the behavior of 11 firms that received substantial payments (at least three
years’ income) as a result of victorious lawsuits; the largest, as an example, was
Texaco’s payment in excess of $2 billion to Pennzoil. The study is restricted to cases
in which the windfall had no obvious effect on the profitability of the recipient’s
investment opportunities. Nevertheless, the management of these recipient firms
had a strong tendency to spend the proceeds of their awards, in part on themselves,
but to a greater extent on acquisitions.4 Payments to shareholders, either through
increased dividends or share repurchases, were less common, and occurred pri-
marily when such actions also benefitted management (either because management
owned a lot of shares, or because the share repurchases were used to buy out large
stockholders who might be troublesome).

More generally, there is a strong positive correlation between cash flows and
investment by large U.S. corporations. Since Meyer and Kuh (1957), this correlation
is often attributed to some type of liquidity constraint. However, this attribution is
questioned by Kaplan and Zingales (1995), who investigate 49 low-dividend-paying
firms that were known to have a strong positive correlation between investment and
cash flow. Kaplan and Zingales classify these firms by the tightness of their financial
constraints; about half the firms in the sample were not constrained in the sense
(p. 12) that they “increased cash dividends, repurchased stock, or explicitly indi-
cated in its annual report that the firm had more liquidity than it would need for
investment in the foreseeable future.” Investment by these unconstrained firms
appears to be more sensitive to cash flow than does investment by other firms. We
are not surprised by this finding. We speculate that the firms that were not finan-
cially constrained in the sample period are conservative organizations that are re-
luctant to borrow. They make investments when they have earned the money to do
so, much as your grandparents waited to buy a car until they had saved up the
money to pay for it. More flypaper.

In theory, the distinction between having money on hand and being able to
raise money without difficulty should have no impact on spending decisions. A good
investment is a good investment, whether funded by retained earnings or by a bank
loan. But in practice, state governments spend most of the money they receive from

4 There are other ways in which managers can dispose of a firm’s resources. For example, it is widely
observed that workers in comparable occupations receive higher wages from more profitable employers
(Thaler, 1989). Managers of wealthy firms may feel inclined, or pressured, to distribute profits to
employees.
the federal government; firms spend most of the money they get as windfalls from other firms. Consequently, when it comes time to predict the behavior of governments, organizations and individuals, it is important to distinguish between the resources they have on hand and resources they could easily get.

* We thank Alan Auerbach, Howard Chernick, Peter Diamond, Wallace Oates, James Poterba, Harvey Rosen, Carl Shapiro and Timothy Taylor for helpful comments.

---

References


