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Intergovernmental Grants and Public Expenditures:

Evidence from a Survey Experiment

Abstract

The relationship between intergovernmental grants and public expenditures is one of the most studied phenomena in the local public finance literature. However, little is known about whether the impact of unconditional grants is fundamentally different from that of other sources of municipal revenue. We study this question by means of a large-scale randomized survey experiment among Danish local politicians, which allows for a comparison of the impact of changes in various sources of municipal revenue. Our findings challenge the conventional conception in the public finance literature that money works differently depending on which sector they are generated in. Instead, ideology plays an important role in explaining how local politicians want to allocate resources when faced with changes in local government revenue.

Keywords: Intergovernmental grants; Public expenditures; Flypaper effect; Asymmetrical response; Survey experiment; Spending preferences

Introduction

The relationship between intergovernmental grants and public expenditures has been heavily studied (see, for instance, Oates 1972; Gramlich 1987; Stine 1994; Gamkhar and Oates 1996; Rodden 2002). The literature makes two central claims about the impact of intergovernmental grants on local public expenditures. First, the flypaper effect hypothesis suggests that intergovernmental grants tend to result in higher increases in public expenditures than a similar increase in citizens' private income would have led to. Empirically, a number of studies have found evidence supporting this hypothesis across time and in different contexts (Courant, Gramlich, and Rubinfeld, 1979; Dahlberg, Mörk, Rattsø, and Ågren, 2008; Deller and Maher, 2006; Filimon, Romer, and Rosenthal, 1982; Gramlich, Galper, Goldfeld, and McGuire, 1973; Mehriiz and Marceau, 2014). Second, the asymmetrical response hypothesis proposes that local governments that benefit from changes in grants will increase expenditures in order to expand local services. On the contrary, local governments who receive smaller grants than hitherto will increase taxes in order to leave services and public spending untouched. Evidence of the asymmetrical response hypothesis is mixed. Some studies find support in favor of the hypothesis (Gramlich 1987; Cárdenas and Sharma, 2011; Deller and Maher, 2006; Heyndels, 2001; Kjaergaard 2015; Lago-Penas 2008; Rattsø and Tovmo 2002) whereas others do not (Gamkhar, 2000; Gamkhar and Oates, 1996). The mixed findings do not, however, change the general conception in the public finance literature according to which changes in unconditional intergovernmental grants are predicted to have an expansive, and hence a fundamentally different, impact on expenditures than changes in other sources of municipal revenue.

However, the literature has so far only been concerned with explaining asymmetrical responses in the event of grant changes. Whether a similar asymmetry is present in the event of changes in citizen private income remains an open question. Thus, we focus on whether the asymmetry

sometimes identified in response to changes in grants is but one case of a wider set of asymmetrical responses to changes in local government revenue, regardless of the revenue source. This would imply that political decision-makers react to changes in unconditional grants in much the same manner as they react to changes in all other kinds of revenue. On the other hand, if an asymmetrical response can only be identified for unconditional grants, it would imply that such grants are drivers of public spending compared to other revenue sources. The question is thus important for the evaluation of the impact of unconditional grants on public spending.

The paper proceeds by presenting the arguments about responses to changes in grants responses in the form of the flypaper effect and the asymmetrical response hypotheses. We then discuss whether asymmetrical effects should be expected for changes in citizen private income as well. This leads to our main hypothesis according to which asymmetrical effects of similar magnitude as those of grants should be expected in relation to changes in citizen income. This is followed by a discussion of methodological challenges associated with testing the impact of grants and citizen income and of how we address these challenges by means of a survey-experimental design embedded in a survey sent to all Danish city councillors in 2014. In particular, this approach allows us to compare the impact of grant changes on expenditures with that of changes in citizen private income. The consecutive section contains the analysis and a discussion of the main findings. In this section, we also examine whether politicians of different ideological orientations differ in their responses to grants and citizen private income. The final section concludes.

Differences in responses to changes in local government revenue

Beginning with Henderson (1968) and Gramlich (1969), a large number of empirical studies within the local public finance literature have found evidence that local governments tend to raise local

expenditures more in response to an increase in intergovernmental grants than in response to a revenue increase of equivalent size stemming from an income increase among their citizens. This phenomenon is known as the flypaper effect (Wyckoff, 1991).

Various explanations have been suggested for why the flypaper effect is observed (see Bailey and Connolly, 1998 for an overview). The most prominent of these explanations, referred to as the theory of 'fiscal illusion', argues that the flypaper effect is a result of voters' failure to correctly assess the average cost of producing public service when unconditional grants pay for part of the service (Courant et al., 1979; Dollery and Worthington, 1996; Oates 1988). If a local government receives an unconditional grant, it can raise the level of public service without raising the tax price voters pay for public service. To voters, this might seem as if the costs of producing public services have been reduced. They may therefore demand more public services than they would have if they had perceived the actual service costs correctly.

The fiscal illusion explanation is used in two different ways: one emphasizes politicians responding to voter demand; and one focuses on the political apparatus trying to expand the public sector. The first explains the flypaper effect as the response of rational politicians to the preference of voters said to suffer from fiscal illusion (Courant et al., 1979; Dollery and Worthington, 1996; Hines and Thaler, 1995; Mehriiz and Marceau, 2014). The demand for public service is expressed through the median voter in the constituency, and the flypaper effect is seen as a failure of the voters to correctly evaluate the impact of grants on the costs of public services.

In the second version of the fiscal illusion explanation, the flypaper effect is argued to be a consequence of budget maximizing politicians and/or bureaucrats trying to deceive voters by letting them believe that public service can be produced at an average cost lower than the real price (Filimon et al., 1982; Oates, 1979). Budget maximizing decision-makers try to expand the public

sector by making voters demand more public service than they would have if they had had a correct perception of the full tax price. Following this explanation, the flypaper effect emerges not just because voters are illusive but because politicians and/or bureaucrats try to hide from them the real costs of delivering public service.

Despite many attempts to evaluate these and other explanations, the literature is still inconclusive as to *why* the flypaper effect is observed (Sobel and Crowley, 2014). All explanations, however, emphasize that grants have a fundamentally different impact on public spending than citizen income in the sense that an increase in local government revenue stemming from an increase in intergovernmental grants leads to relative larger increases in public spending than does an increase of equivalent size stemming from increased citizen income. Building on these explanations and the empirical evidence, we test the following hypothesis:

H₁: An increase in grants has a stronger stimulatory impact on public spending than an increase of equivalent size in citizens' income.

Inspired by the flypaper effect, a more recent literature investigates whether the response to changes in grants from a higher-level authority differs depending on whether grants are *decreased* or *increased* (Gamkhar and Oates, 1996; Heyndels, 2001; Mehriiz and Marceau, 2014; Stine, 1994; Volden, 2007). According to the asymmetrical response hypothesis, increases in public spending when grants are increased are expected to be larger than cuts in spending when grants are reduced with a similar amount (Gamkhar and Oates, 1996). This asymmetry in responses to grants is explained with reference to the argument that publicly funded programs create constituencies that will fight to maintain existing programs (Gramlich, 1987; Gamkhar and Oates, 1996). When an

intergovernmental grant finances a program, pressure groups organize to fight for the program even if intergovernmental grants are cut back (Dougan and Kenyon, 1988; Gamkhar, 2000). If an intergovernmental grant is *increased*, the asymmetrical response hypothesis predicts that a large share of the grant will be spent on new publicly funded programs or on raising funds for already existing ones. In the extreme case, all money will be spent on public service, leaving local tax levels, local savings, and debt levels entirely untouched. In the case of a grant *decrease*, the asymmetrical response hypothesis argues that spending will not be cut as much as it would be raised in the case of a grant increase. In the extreme case, public spending will be left completely untouched, and the grant decrease will be financed by increasing own source revenue (i.e., raising local taxes, issuing new debt, or using existing savings). This expectation is formulated in the following hypothesis:

H₂: Grant increases lead to increases in public spending larger than the cut in public spending when grants are decreased.

In combination, the literature on the flypaper effect and the asymmetrical response hypothesis thus suggests that grants have an asymmetrical and expansive impact on public spending and that grant increases have a stronger stimulatory impact on public spending than increases in citizen income of equivalent size. Does this mean that the impact of grants on public spending is fundamentally different from that of citizen income? Not necessarily. The answer depends on whether asymmetrical responses to changes in municipal revenue are a phenomenon delimited to grants, or whether expansive asymmetrical responses of similar or even larger magnitude exist for citizen income as well. A quite different interpretation of the findings might emerge if, for instance, public

expenditures are cut to a larger extent in response to grant decreases than in response to a decrease of equivalent size in local government revenue stemming from a decrease in citizen income.

There are at least two arguments for why politicians may also respond asymmetrically to changes in citizen income, both having to do with reelection-oriented politicians being rewarded more by the constituency for keeping the service level high than for keeping taxes low. First, this may be the case if the constituency has a general preference for a high service level even at the expense of keeping taxes high. In that case, the politicians may be inclined to use additional revenue stemming from increases in citizen income to increase spending on services, while they on the other hand may be reluctant to cut services in the event of declines in municipal revenue due to decreases in citizen income. Whether the constituency actually prefers high services to low taxes is, of course, an empirical question.

Second, parallel to the argument that grants have an asymmetrical impact on local government spending because the electorate suffers from fiscal illusion, the electorate may also suffer from fiscal illusion related to citizen income. This is the case if the electorate does not perceive the true costs of services and base their estimate of the costs of services on their relative tax payment (the tax rate) rather than the total amount paid (which also depends on the private income). While the amount paid in taxes by a citizen is highly visible to that individual, the amount paid by all others is much less visible. The amount paid is therefore unlikely to be a useful predictor of the costs of public services for single citizens. If a local government experiences an increase in revenue due to an increase in citizen income, it may raise the level of public service without raising the tax rate. As it was argued in the case of grants, this may to voters seem as if the costs of producing public services have been reduced. They may therefore demand more public services than they would have if they had perceived the actual service costs correctly. Based on these arguments we hypothesize that:

H₃: Increases in citizen income lead to increases in public spending larger than the cut in public spending when citizen income decreases.

Design and contextual background

In order to test whether changes in intergovernmental grants and citizen income affects spending differently on a case as relevant as possible, we need a context where local governments play an important role in delivering welfare, where both intergovernmental grants and local taxes are important for local revenue, and where local governments have sufficient autonomy to respond to changes in local revenue. Addressing these issues, the hypotheses are tested within Danish municipalities. Danish municipalities are multi-purpose governments responsible for producing and delivering a wide range of core welfare services. In total, the municipal functions amount to about two-thirds of all public expenditures (Blom-Hansen and Heeager 2011: 227). The municipal expenditures are financed by various sources. About 50 per cent of the municipal revenue stems from income taxes. The municipalities have independent taxation rights, and the income tax rate in 2014 varies with more than five percentage points across municipalities (Ministry of Economic Affairs and the Interior 2014). Since a proportional tax system is used, the revenue both depends on the income tax rate and the taxable base (the size of citizen income). Central government grants constitute the second most important source of revenue. Approximately 32 per cent of the municipal revenue is covered by the two main grant types: matching grants that are used to help finance local transfer payments and a general, unconditional block grant (Blom-Hansen et al. 2014: 66). Thus, the hypotheses are tested in a setting where both income taxes and central government grants are of major importance to the size of the municipal revenue.

The independent taxation right and the fact that many core functions are decentralized to municipalities means that Denmark generally scores high in international comparisons of local autonomy (Page 1991; Boadway and Shah 2009). However, in 2009, a tax limitation was introduced aiming at limiting local government tax increases. The tax limitation means that municipalities are punished with a cut in their block grant in case they raise local tax rates, thereby reducing the incentive to raise taxes (Blom-Hansen et al. 2014). Having effect from 2014 and onwards, the central government further strengthened the control with municipal spending by introducing an expenditure ceiling according to which municipal spending on services has to be within limits decided by law. In case the spending of a given municipality exceeds the ceiling, the municipality will be punished with a cut in its block grant.

The expenditure ceiling makes additional spending unattractive. Hence, municipalities might decide to cut tax rates rather than raise spending in case their revenues increase. This applies regardless of whether the additional revenue stems from grant increases or increases in the taxable base. The expenditure ceiling is therefore likely to curb possible flypaper effects in Danish municipalities, meaning that this is a conservative case for flypaper effects. Moreover, since the tax limitation imposes sanctions on municipalities that let their tax rates increase, it is less attractive to react to decreases in local government revenue by increasing the tax rate to uphold the same level of spending as expected by Hypothesis 2 and 3. Therefore, there is a bias against the expectation of the asymmetrical response hypothesis regardless of whether local government revenue has increased or decreased. Again, the Danish case is a conservative one in terms of testing the hypothesis.

Studies of the impact of intergovernmental grants have primarily been based on observational data. Many of these studies are challenged by misspecification and simultaneity issues. First, the observed flypaper effects and asymmetric responses may simply be a result of misspecified empirical models (Hines and Thaler 1995). One kind of misspecification relates to endogeneity

caused by a failure to include important socioeconomic variables related to both changes in grants and public spending (Hamilton 1983). As a result, the size of the flypaper effect is overestimated or may even be an artefact caused by the misspecification. A second kind of misspecification refers to the failure to distinguish between matching grants and non-matching grants when estimating the effect of grants as compared to the effect of income increases (Megdal 1987). Matching grants have been found to have larger stimulating effects on public spending than do unconditional lump sum grants (Bradford and Oates 1971).

Second, central government grants are typically provided in response to local government needs and/or the demographic composition of the local government population. However, the population composition is likely affected by the economic policy in the municipality. Excessive spending on services, for instance, is likely to attract some groups, whereas others might prefer a low tax rate to a high level of spending. Moreover, citizens may respond to dissatisfaction with tax/service packages by exiting their jurisdiction and thus engage in ‘Tiebout sorting’ (Tiebout 1956). In this case, the economic policy will affect the size of grants and thus bring about a misspecification of empirical models due to selection bias.¹

To address these challenges, we conducted a large-scale randomized survey experiment embedded in a survey sent to all elected politicians to Danish city councils in January 2014. 1342 politicians responded to the survey experiment, corresponding to a response rate of 54 per cent² Local politicians decide how their local government should react in case the level of municipal revenue changes, and they are thus useful study objects when the focus is on local government response to intergovernmental grants. Using responses from individual politicians means that our study

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¹ A few studies address the endogeneity problem by using an exogenous grant shock to estimate effects of grant changes (Dahlberg et al., 2008; Gordon, 2004; Knight, 2002).

² Because of non-response on background variables used in the analysis, only 1324 responses are used in the analysis. The exclusion of 18 responses does not, however, alter our findings.

essentially is a study of whether flypaper effects and asymmetrical responses can be found at the micro level. An additional advantage of using local politicians as study objects is that it allows for an analysis on a large-N dataset, while most analyses on the macro level involves a comparatively low number of observations.

Experimental methods have previously been used to study the related phenomena of fiscal illusions (Winter and Mouritzen 2001) and tax illusions (Blom-Hansen 2005; Sausgruber and Tyran 2005) but has to our knowledge not previously been used to study responses to changes in local government revenue. We decided on an experimental approach for several reasons. First, survey experiments allow the researcher to manipulate the explanatory variable in order to circumvent measurement error and to create the variation necessary to conduct the desired statistical tests. Our experiment thus allows us to focus specifically on unconditional grants and to compare the impact of changes in unconditional grants with the impact of changes of a similar size in citizen income. Second, random assignment to different treatment groups assures that groups are probabilistically similar on average and differ only with regard to the treatment that they have received.³ Thus, random assignment allows for an estimation of the causal impact of treatments (Shadish, Cook and Campbell 2002: 13). On the flip side, however, these advantages come at a price since experiments usually have low ecological and external validity (Morton and Williams 2010: 265). Hence, experimental findings may not travel beyond the experimental setting. We tried to limit such disadvantages by focusing on real politicians and by presenting them with fairly realistic scenarios.

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³ Analyses (not shown here) show that the treatment groups are indeed not statistically significantly different from one another on background characteristics such as gender, age, level of education, and party affiliation.

The survey experiment

In order to test our hypotheses, variation is needed in whether municipal revenue changes are brought about by either changes in unconditional grants or citizen income (the taxable base). Moreover, variation is needed in whether the municipal revenue increases or decreases. The experiment therefore uses a between-subjects 2x2 factorial design in which each politician was randomly assigned to one of four possible vignette scenarios. Vignettes are short but realistic descriptions of a scenario that respondents could also meet in the real world, and they are therefore well suited to test politicians' reactions to municipal revenue changes. The specific text for each vignette is shown in Table 1 while descriptive statistics are presented in Table 2.

Table 1 about here

Table 2 about here

First, some politicians were presented with a hypothetical scenario in which the municipal revenue increases because of an increase in intergovernmental unconditional grants (Vignette 1). Second, in another scenario, the municipal revenue increase is instead caused by an increase in the taxable base (Vignette 2).⁴ An increase in the municipal revenue may either be used to increase the service level by means of more public spending or to keep the service level constant while decreasing taxes. Responses to increases in the municipal revenue may therefore be measured on a continuum from spending everything to using all the revenue on tax cuts.⁵ Accordingly, the politicians were asked

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⁴It is not clear exactly how politicians respond to different amounts for grant/income changes. We used the same amount in all scenarios even though only a portion of the taxable base will translate into municipal revenue since this makes the wording of the treatments more similar. Other research suggests that the amount size does not matter much to the findings and that similar reactions should be expected to other amounts. Thus, Houlberg, Olsen, and Pedersen (2014) find that Danish politicians respond similarly to grant increases regardless of the size of the increase.

⁵ Theoretically, other reactions are possible too. For instance, increases in the municipal revenue may be used to cover municipal debt. However, in the long run, taxes must finance municipal expenditures. Moreover, Danish municipalities are not free to issue debt to finance operating costs. In order to keep the experiment as simple as possible, we thus stuck to a stylized situation in which the respondents had to make a trade-off between two reactions.

how they would prefer to use the additional revenue. Answers were provided on an 11-point scale going from 0 ('100 per cent of the additional revenue should be used on increased municipal spending, and 0 per cent should be used on cutting taxes') to 10 ('0 per cent of the additional revenue should be used on increased municipal spending, and 100 per cent should be used on cutting taxes'). The respondents were able to decide on an answer between the endpoints of the scale. The value 5, for instance, corresponds to 50 per cent being used on increased municipal spending and 50 per cent on cutting taxes.

The two remaining scenarios mirrored the first two with the important difference that respondents were presented with scenarios in which the municipal revenue decreases either because of a decrease in intergovernmental unconditional grants (Vignette 3) or because of a decrease in the taxable base (Vignette 4). In both cases, the decline in municipal revenue is of the same numerical size as the increase in municipal revenue in the first two vignettes. Responses to Vignettes 3 and 4 were also provided on an 11-point scale going from 0 ('the decrease in municipal revenue should be covered 0 per cent by less municipal spending and 100 per cent by increasing taxes') to 10 ('the decrease in municipal revenue should be covered 100 per cent by less municipal spending and 0 per cent by increasing taxes'). To summarize, the response variable to the various vignettes captures to what extent politicians respond to municipal revenue changes by changing either the level of public spending or the tax rate.

Table 3 about here

Table 3 shows how the hypotheses are tested by combining politician responses with the various vignettes. The flypaper effect suggests that politicians to a greater extent prefer increases in public expenditures when facing an increase in intergovernmental grants than when facing an increase of a

similar size in the municipal income from taxes. This hypothesis finds support in case the politicians are significantly more inclined to favor spending in Vignette 1 than in Vignette 2. The asymmetrical response hypothesis suggests that politicians to a greater extent prefer increasing expenditures in case intergovernmental grants increase than they prefer to cut expenditures in case of a grant decrease of similar size. Evidence supports this hypothesis in case politicians to a significantly higher extent prefer increases in spending in Vignette 1 than they prefer spending cuts in Vignette 3. The hypothesis about asymmetric responses to income changes is tested by comparing responses to Vignettes 2 and 4. The hypothesis is supported in case the politicians to a significantly higher extent prefer spending increases in Vignette 2 than they prefer cutting expenditures in Vignette 4.

Findings

While the respondents were randomly assigned to experimental groups, a regression approach to analyzing the data including controls is still useful, since including controls may generate more precise estimates of the causal effect of our experimental treatment (Angrist and Pischke 2009: 23f). With regard to the individual level, we control for gender, level of education, party affiliation, and whether the respondents are part of a finance committee or the mayor coalition. These variables have all been shown to affect politicians' spending preferences in previous research and thus are also likely to be relevant to how they want to allocate resources if municipal revenue increases or decreases (Serritzlew 2003; Blom-Hansen, Baekgaard and Serritzlew 2015). Summary statistics and a short explanation of the control variables used in the regression can be found in Table 4.

Table 4 about here

Finally, we use municipality-fixed effects to account for cross-municipal differences (Allison 2009).⁶ In all regressions, the dependent variable is running from 0 to 10 as in the original vignettes, with 0 indicating that the change in revenue should be used solely on changing the level of spending on public services whereas 10 indicates that the change in revenue should be used to affect the tax rate only. The results are shown in Table 5.

Table 5 about here.

Hypothesis 1 about the flypaper effect is tested in Model 1 by computing a dummy variable to distinguish between politicians who were presented with grant increases (vignette 1) and increases in income (vignette 2). As can be seen, the dummy variable is negative and statistically significant on a .05 level, meaning that politicians who received the grant increase vignette are more inclined to spend the additional revenue on public services than are politicians who were told that the revenue increase came from increases in citizens' income. A calculation of the effect size of the treatment furthermore indicates a rather weak treatment effect (Cohen's $D = 0.14$). The finding thus lends some, albeit rather weak, support to Hypothesis 1.

⁶ Various checks reveal that our results are robust to other specifications of the analysis. First, the fixed effects and the controls do not matter substantially to the findings. If the analysis is conducted without both, the following average treatment effects are estimated (cluster robust standard errors in parentheses): Model 1: -0.48 (0.26); $p=0.06$. Model 2: -0.21 (0.30); $p=0.497$. Model 3: 0.52 (0.25); $p=0.04$. Second, we followed the advice of Bertrand, Duflo, and Mullainathan (2004) and report cluster-robust standard errors since usual standard errors of the fixed effects estimator are likely to be drastically understated in the presence of serial correlation. However, running the models with usual standard errors instead does not make a substantial difference to any of the findings reported in the article.

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The asymmetrical response hypothesis (Hypothesis 2) is tested by comparing responses to Vignettes 1 and 3. This hypothesis is tested by computing a dummy variable distinguishing between respondents who were presented with grant increases (vignette 1) and politicians who faced the grant decrease vignette (vignette 3). This variable is very far from being statistically significant ($p > 0.6$). This indicates that politicians are on average equally willing to increase public spending when grants are increased as they are to cut public spending when grants are decreased. Hence, no support is found for the asymmetrical effect of intergovernmental grants.

Finally, the third hypothesis is tested in the same way as Hypothesis 2 but now comparing responses to Vignettes 2 and 4. The coefficient of the main explanatory dummy variable (labelled 'Revenue increase') is positive and significant and hence, in contrast to what was expected, indicates that politicians are on average less inclined to increase public spending when citizens' income increases than they are willing to cut public spending when citizens' income declines. Thus, Hypothesis 3 about an expansive asymmetrical response to citizen income changes is rejected. Summing up, a comparison of the findings in the analyses of Hypothesis 2 and 3 suggests a pattern very different from what was expected: symmetrical responses to grant changes and reverse asymmetrical responses to income changes. This raises the question why we find a pattern so different from what we would expect based on the literature.

Heterogeneous effects

To acquire a better understanding of our findings, we turn to the 'politics matters' literature. It is well known in this literature that the ideology of the incumbent party matters to political outputs and outcomes (see, e.g., Boyne 1996; Schmidt 1996; Blom-Hansen et al. 2006). Responses to grant changes is essentially an ideological question that has to do with classical redistributive policies and

the size of government. If ideology does indeed matter to how politicians respond to intergovernmental grants, we should expect only politicians on the left wing to respond to revenue changes in accordance with Hypothesis 2 and 3. Left-wing politicians are usually expected to prefer higher spending and a larger public sector, and we should therefore expect them to seize the opportunity to increase the size of the public sector by increasing public spending in the event of grant increases whereas they might try to find other ways to accommodate grant decreases than by cutting spending. Conversely, right-wing politicians are usually expected to prefer a small public sector, low taxes, and low public spending, and they are therefore likely to seize the opportunity to cut taxes rather than increase spending in the event of grant increases while they are likely to prefer lower spending to higher taxes in the event of grant decreases. Hence, a reverse asymmetry in responses to grants should be expected among right-wing politicians.

In order to examine the question of the impact of party ideology on responses to grants, we interact the ‘revenue increase’ variable with the party affiliation dummy, which takes the value 1 in case the politician is from a left-wing party (i.e., either the Red-Green Alliance, the Socialist People’s Party or the Social Democrats) and 0 in case the politician is from another (center or right-wing) party.⁷

Table 6 and Figure 1 present the findings.⁸

Table 6 about here

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⁷ The robustness of all our findings was tested by rerunning the analysis with alternative operationalizations of party affiliation. For instance, we reran the analysis with a specification in which we used two dummies to distinguish between left-wing, center, and right-wing parties. Such alternative specifications do not alter the overall findings.

⁸ It may be argued, that political affiliation is likely to be affected by politicians’ preferences and hence that reverse causality is likely to bias our findings. However, the dependent variable in the analysis measures to what extent politicians respond to changes in municipal revenue by either adjusting expenditures or tax rates. This response is unlikely to affect political affiliation. For instance, it seems implausible that politicians who are more likely to adjust expenditures (either up or down) in response to changes in local government revenue to a higher extent should be left-wings.

Figure 1 about here

Focusing first on the analysis of asymmetrical responses to grants, it can be seen that both the constitutive terms and the interaction term are highly statistically significant. Thus, in contrast to the analysis of main effects only in Table 5, both the treatment effect and political affiliation becomes highly significant when we allow for heterogeneous responses. Based on the analysis, the average responses to grant changes can be calculated for left- and right-wing politicians, respectively. For left-wing politicians, the average response is 2.5 if they are presented with the grant increase vignette (Vignette 1) whereas the response is 7.7 in case they are presented with the grant decrease vignette (Vignette 3). The average difference in responses to Vignettes 1 and 3 is thus 5.2 or more than half the scale of the dependent variable. Substantially, the finding lends strong support to the notion that left-wing politicians to a greater extent prefer increasing expenditures in case intergovernmental grants increase than they prefer to cut expenditures in case of a grant decrease of equivalent size. For right-wing politicians the average response is 6.8 among those who are presented with the grant increase vignette (Vignette 1) while the response is 3.0 for those presented with the grant decrease vignette (Vignette 3). Again, the findings are of substantial magnitude and show that right-wing politicians to a higher extent are inclined to decrease expenditures in the event of grant decreases than they are to increase expenditures in the event of grant increases. In conjunction, the findings lend support to the asymmetrical response hypothesis but only among left-wing politicians; a reverse asymmetrical response is found among right-wing politicians. Accordingly, the findings suggest that the asymmetrical response to intergovernmental grants suggested by Hypothesis 2 to a large extent is a matter of political ideology. This may help explain the somewhat mixed findings in the literature with regard to this hypothesis.

Model 2 presents the analysis of whether party ideology matters for responses to citizen income changes. As can be seen from Figure 1 which presents the asymmetrical responses to grants and income, the findings are very much in accordance with Model 1. It appears that politicians to the same extent respond asymmetrically to grant and income changes when ideology is taken into consideration. This finding contradicts both the expectation in the literature and the first interpretation of our results and points to the importance of ideology in understanding the effects of changes in local revenue.⁹

In conclusion, the test of Hypothesis 1 shows evidence in favor of the flypaper effect. This effect, however, is quite small, and since politicians to the same extent respond asymmetrically to grant and income changes, our findings raise doubt as to whether intergovernmental grants have a fundamentally different impact on public spending than other sources of local government revenue, as often suggested in the literature.

Conclusion

This article examines responses to changes in local government revenue with an emphasis on whether the impact of unconditional intergovernmental grants on public spending differs from that of citizen income. Our findings support the notion of a flypaper effect where increases in grants are associated with stronger preferences for increased spending than are increases in citizen income. The effect, however, is relatively small. Moreover, when taking into account the ideological orientation of local politicians, we identify an asymmetrical pattern to local government revenue changes where left-wing politicians respond by raising spending when grants and income *increase*

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⁹ A restricted sample test conducted only on mayor party members yields no substantive differences from the ones presented here, although the differences between right-wing and left-wing politicians are not quite as pronounced as in Table 6.

and by raising taxes when grants and income *decrease*. On the contrary, right-wing politicians tend to cut taxes when grants and income *increase* and tend to cut spending when grants and income *decrease*. Overall, these findings lead to two main conclusions. First, contrary to the conventional conception in the public finance literature, the findings indicate that responses to grants are not substantially different from responses to citizen income. Second, ideology appears to play an important role in the response of local politicians to changes in local revenue. Whether intergovernmental grants are drivers of public spending thus seems to depend on who is in power at the local governmental level.

Our findings are based on a large-scale survey experiment with Danish local politicians. This approach allows us to study the causal impact of comparable changes in two major sources of local government revenue, grants and citizen income. While our experimental approach offers some advantages compared with approaches where the impact grants are studied on the macro level, it also brings with it certain limitations. First, local government spending decisions are not made by individual politicians alone. Relatedly, questions about how to respond to changes in local revenue never enter the local decision-making process in a vacuum but will often be a part of a complex decision-making process in which many factors influence the decision about how to adjust local tax rates and spending levels. Therefore, we might not observe as clear responses in a real decision-making process if local revenue changes.

Second, our survey experiment allowed politicians to respond to changes in local revenue only by adjusting taxes or spending levels. In reality, local decision-makers might have other response options, such as issuing debt or adjusting savings. Which of the own source revenue options are available to local governments differs across institutional contexts and over time. For example, balanced budget rules imposed on local governments by the national government might limit the response options for local governments. In recent years, Danish municipalities have faced heavy

sanctions when they have raised taxes or expenditures above a certain limit. In formulating the vignettes, we have accounted for this by emphasizing that local politicians in our scenarios were free to spend the money, but we cannot entirely exclude the possibility that the tax and expenditure ceilings have influenced the response. However, in that case, it is most likely that it has had a conservative impact on our findings.

The option to spend existing savings (when grants or citizen income decreases) or to add to savings (when grants or citizen income increases) might be favored by some politicians in the short run. In the long run, however, municipalities are not supposed to generate a surplus, making it reasonable to ask politicians to choose between adjusting taxes or public spending. Similarly, Danish municipalities are in general not able to borrow money to finance operating costs. While these alternative own source revenues do not seem very attractive in a Danish setting, differences in these options across institutional contexts might limit the generalizability of our findings. This calls for more research investigating alternative response options to changes in local government revenue and for research examining the impact of the institutional context on responses to changes in local government revenue.

Likewise, while our experiment is strong in establishing the causal impact of our treatments, it is less strong in terms of establishing the mechanisms behind the effect. For instance, based on the findings, we cannot know whether flypaper effects come about because of fiscal illusions as suggested by theory or whether more pragmatic considerations guide the results. For instance, citizen income might be considered more volatile over time than grants, and politicians may therefore be more inclined to use additional resources from income to build up savings for bad times. We consider the lack of knowledge about the causal mechanism a general weakness in the literature on the impact of grants. Future research may therefore do well to dig deeper into the reasons behind macro-level theories of responses to source effects in government revenues, by for

instance, designing micro-level experiments explicitly aimed at uncovering the theoretical mechanism rather than at testing the predictions of the theory.¹⁰

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¹⁰ We are indebted to an anonymous reviewer for this suggestion.

Tables and figures

Table 1: The four vignettes

Vignette 1: Grant increases	Vignette 2: Citizen income increases	Vignette 3: Grant decreases	Vignette 4: Citizen income decreases
Imagine that, in the future, your municipality will experience an increase in central government unconditional grants amounting to DKK 1,600 per capita per year.	Imagine that, in the future, your municipality will experience an increase in the taxable base amounting to DKK 1,600 per capita per year.	Imagine that, in the future, your municipality will experience a decrease in central government unconditional grants amounting to DKK 1,600 per capita per year.	Imagine that, in the future, your municipality will experience a decrease in the taxable base amounting to DKK 1,600 per capita per year.
This gives your municipality the opportunity to lower tax rates, increase the service level, or a combination of the two.	This gives your municipality the opportunity to lower tax rates, increase the service level, or a combination of the two.	This means that your municipality either has to increase tax rates, lower the service level, or a combination of the two.	This means that your municipality either has to increase tax rates, lower the service level, or a combination of the two.
If your municipality was completely free to decide, how would you prefer it to react to the increase in grants? ¹	If your municipality was completely free to decide, how would you prefer it to react to the increase in the taxable base? ¹	If your municipality was completely free to decide, how would you prefer it to react to the decrease in grants? ²	If your municipality was completely free to decide, how would you prefer it to react to the decrease in the taxable base? ²

¹: Responses were given on an 11-point scale running from 0 ('100 per cent of the additional revenue should be used on increased municipal spending, and 0 per cent should be used on cutting taxes') to 10 ('0 per cent of the additional revenue should be used on increased municipal spending, and 100 per cent should be used on cutting taxes').

²: Responses were given on an 11-point scale running from 0 ('the decrease in municipal revenue should be covered 0 per cent by cutting municipal spending and 100 per cent by increasing taxes') to 10 ('the decrease in municipal revenue should be covered 100 per cent by cutting municipal spending and 0 per cent by increasing taxes').

Table 2: Descriptive statistics

Vignette	Mean	SD	Min	Max	N
Vignette 1:	3.89	3.66	0	10	333
Vignette 2:	4.39	3.58	0	10	322
Vignette 3:	4.12	3.65	0	10	327
Vignette 4:	3.86	3.36	0	10	343

Table 3: Using a comparison of vignette responses to test the hypotheses

Hypothesis:	The hypothesis finds support if answer to:
H1: The flypaper effect	Vignette 1 < Vignette 2
H2: Asymmetrical effects of grant changes	Vignette 1 < Vignette 3
H3: Asymmetrical effects of income changes	Vignette 2 < Vignette 4

Table 4: Summary statistics of control variables

Variable	Values	Mean	SD	Min	Max
Left-wing party	Politicians representing the Red-Green Alliance, the Socialist People's Party and the Social Democrats = 1; All other = 0.	0.43	0.50	0	1
Member of mayor party	Members of the mayor party = 1; All other = 0.	0.38	0.49	0	1
Finance committee member	Finance committee member = 1; All other = 0	0.30	0.46	0	1
Male	Male = 1; Female = 0	0.69	0.46	0	1
Long education	University degree or alike = 1; Less than university degree or alike = 0.	0.77	0.42	0	1

N = 1324.

Table 5: Testing the hypotheses. Municipality fixed effects regression (clustered robust standard errors).

	Model 1: The flypaper effect	Model 2: Asymmetric effects of grants	Model 3: Asymmetric effects of income
Change in grants	-.45 (0.22)**		
Revenue increases		-0.15 (0.33)	0.46 (0.27)*
Left-wing party	-3.88 (0.24)***	0.14 (0.29)	0.23 (0.28)
Member of mayor party	0.53 (0.24)**	0.14 (0.33)	-0.22 (0.27)
Finance committee member	0.07 (0.27)	-0.63 (0.31)**	-0.12 (0.34)
Male	0.46 (0.24)*	0.43 (0.25)*	0.23 (0.30)
Long education	-0.11 (0.31)	-0.04 (0.43)	0.03 (0.33)
Intercept	6.61 (0.40)***	5.00 (0.49)***	4.73 (0.43)***
R^2_{within}	0.32	0.01	0.01
R^2_{between}	0.41	0.02	0.01
N	654	659	665

Notes: *: $p < .1$, **: $p < .05$, ***: $p < .01$. Positive coefficients indicate that respondents to a higher extent prefer adjusting the tax level in response to municipal revenue changes the higher the value of the variable.

Table 6: The Impact of Party Ideology on Responses to Changes in Municipal Revenue.

Municipality fixed effects regression (clustered robust standard errors).

	Model 1: Grant changes	Model 2: Citizen income changes
Revenue increases	3.77 (0.31)***	3.94 (0.36)***
Left-wing party	4.66 (0.36)***	4.17 (0.32)***
Revenue increases * left-wing party	-8.93 (0.45)***	-8.05 (0.51)***
Member of mayor party	-0.06 (0.26)	-0.22 (0.22)
Finance committee member	0.03 (0.26)	0.01 (0.27)
Male	0.37 (0.22)*	0.25 (0.26)
Long education	-0.09 (0.35)	0.05 (0.28)
Intercept	2.83 (0.44)***	3.00 (0.38)***
R^2_{within}	0.37	0.33
R^2_{between}	0.39	0.36
N	659	665

Notes: *: $p < .1$, **: $p < .05$, ***: $p < .01$. Positive coefficients indicate that respondents to a higher extent prefer adjusting the tax level in response to municipal revenue changes the higher the value of the variable.

Figure 1: Asymmetrical effects for Grants and Citizen Income by Party.

Note: Positive values correspond to asymmetrical effects where politicians prefer to cut expenditures more when municipal revenue increases than they prefer to increase expenditures when revenue decreases. Conversely, negative values mean that politicians prefer to increase expenditures more when municipal revenue increases than they prefer to cut expenditures when facing a decrease in municipal expenditure of equivalent size.

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