DISCUSSION PAPER SERIES

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IZA DP No. 6712

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July 2012

Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

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IZA Discussion Paper No. 6712
July 2012

ABSTRACT

Why Not Fully Spend a Conditional Block Grant?*

This paper studies a conditional block grant that Dutch municipalities receive for welfare-to-work programs. Many municipalities do not fully use this grant, although programs are beneficial for them. We argue that municipalities incur expenses to use the grant. If these costs are substantial, then it is optimal not to fully use the grant. Based on municipality-specific data on grants and actual expenditures, we estimate that municipalities have to add about 90 cents from their own resources to spend 1 euro of the grant. As a result, the conditional block grant is de facto a closed-ended matching grant.

JEL Classification: H77, H20, H71, I38

Keywords: intergovernmental grants, conditional block grants, welfare-to-work programs

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* Views expressed are those of the authors and do not necessarily reflect the official positions of the CPB Netherlands Bureau for Economic Policy Analysis or the Ministry of Social Affairs and Employment. We thank Jan Boone, Paul de Bijl, Heleen Hofmans, Wouter Roorda, Patrick Voogd, Jan van Eck, Margaretha Buurman, Marta Curto Grau, Wolter Hassink, Evert Jan Slootweg, and participants of seminars at the CPB Netherlands Bureau for Economic Policy Analysis, the Ministry of Social Affairs and Employment, and the tenth LAGV conference for helpful comments.

1 Introduction

Intergovernmental grants are an important resource for subnational governments. Many of these grants are conditional, which means that the recipient can only spend the grant on one particular purpose (e.g., welfare-to-work programs). A conditional grant can be a block grant or a matching grant. In the former case the recipient gets a fixed amount of money, in the latter case the donor finances a fixed share of the recipient's expenditures. A grant can also be unconditional, which means that the recipient can decide how to spend it. A conditional grant is beneficial if the expenditures of the recipient also benefit others and the recipient does not take these spillover benefits into account. For an overview of conditional intergovernmental grants and data on their importance see, e.g., Oates (1999), Bergvall, Charbit, Kraan, and Merk (2006), Huber and Runkel (2006), and Boadway and Shah (2007).

There is a large literature on how subnational governments spend conditional grants. As economic theory suggests, after receiving the grant, subnational governments' total spending on the specific purpose often increases by a lower amount than the size of the grant since the grant is crowding out other resources that were spent on this purpose before the grant was received. This is known as the fungibility effect (see, e.g., McGuire (1978), Zampelli (1986), Gordon (2004), and Evans and Owens (2007)). Another finding in the literature is that although this crowding out takes place, it is often smaller than what economic theory predicts. Subnational governments spend a larger part of the grant on the specific purpose than expected. This is called the flypaper effect (see, e.g., Hines and Thaler (1995) for an overview).

In this paper, we take a different perspective and do not study *how* subnational governments spend a conditional block grant, but *whether* they spend it. In practice, it occurs regularly that recipients do not fully use conditional block grants. For example, recipients do not use large parts of several conditional block grants of the European Union (European Commission (2011*a*)) (more details and other examples follow below).[1] We study the case in which the Dutch national government provides a conditional block grant to municipalities to finance welfare-to-work programs. A welfare-to-work program can

[1] Others study situations in which subnational governments reject a grant because their policy goals interfere with the conditions of the grant (e.g., a grant for abstinence-only education). Another related question is whether subnational governments apply and lobby for grants. See, for example, Chernick (1979), Stein (1979, 1981), Foster (1981), Rich (1989), Schneider and Ji (1990), Knight (2002), Bickers and Stein (2004), Volden (2007), Craw (2010), and Doan and McFarlane (2012). In our setting, however, policy goals of the national and subnational government do not fundamentally differ and the subnational government automatically receives the grant.

be (almost) anything that helps residents of a municipality to find a job. It can even be a (temporary) public service job. Municipalities have a direct benefit from (successful) programs since they are financially responsible for social assistance. If municipalities do not fully spend the grant, they have to transfer the surplus back to the national government. You might expect that municipalities are very eager to spend the grant: they get "free money" for programs and they can use the money that they save on social assistance in any way they wish.[2] However, many municipalities spend the grant only partially.

We argue that there exist costs for municipalities to use the conditional block grant and we estimate these hidden costs. The central message of this paper is that municipalities do not fully spend their grant because the costs of using it outweigh the benefits at high spending levels.[3] First, we emphasize that a program is not completely free for a municipality. The costs of a welfare-to-work program consist of direct and indirect costs. Direct costs are the costs of the actual program that an individual participant receives. These are, for example, the amount of wage subsidy or the course fee. Indirect costs are all other costs of the program. These are, for example, the cost of selecting a suitable participant, deciding on the appropriate type of program for the participant, procurement of the program, and monitoring the program participant and the company that carries out the program, but also the costs of cleaning civil servants' offices and heating the city hall. Municipalities can only use their grant to finance direct costs. They can assign these costs to an individual participant and thereby prove to the national government that these costs result from a welfare-to-work program. However, municipalities cannot use the grant for indirect costs since they cannot assign these costs to an individual participant and therefore it is more difficult to check for the national government whether these costs really result from a program. Municipalities have to pay indirect costs from their own resources.[4]

[2] See, e.g., Divosa (2006), Van Geuns, Mallee, Soethout, Van Waveren, and Wissink (2006), and Berkhout and Mallee (2008).

[3] Stein (1979, 1981) mentions three types of costs that subnational governments possibly incur in case they are seeking and receiving a grant: costs of applying for the grant, costs of implementing the grant, and opportunity costs (the costs of curtailing other expenditures due to the costs of application and implementation). Stein hypothesizes that if these costs are high, subnational governments seek grants less frequently. We focus on the costs of using the grant (i.e., the costs of implementing the grant and the opportunity costs) as municipalities do not have to apply for the grant that we study.

[4] In the case of federal funded research grants in the United States there exists a similar distinction between direct costs (e.g., personnel and equipment during the project) and indirect costs (e.g., university libraries and building maintenance). Direct costs are easy to assign to a specific project, indirect costs of a project are difficult to measure (see, e.g.,

Second, we show that if these indirect costs are sufficiently high, then it is optimal for a municipality not to spend the grant completely. In that case, the marginal costs of using an additional euro of the grant are higher than the marginal benefits (the lower expenditures on social assistance that it causes). The intuition behind this result is as follows. If the indirect costs increase, then a municipality spends less of the grant than the national government wishes since a decrease in expenditures on programs costs a municipality less than the national government due to spillover benefits of programs (after all, these spillover benefits are the reason that the national government provides a conditional grant).

Third, we estimate the indirect costs. We start by estimating the revenues of using the grant via municipality-specific data on program expenditures and outflow from social assistance. Afterward, we combine this information with municipality-specific data on grants and numerically solve our model. The solution of the model is the level of indirect costs at which the decision that maximizes the municipality's profit is most similar to the real decision of the municipality. As a robustness check, we also estimate costs via a simplified model that has an analytical solution. We find that for each euro of the grant that a municipality uses, it has to add on average about 90 cents from its own resources. Therefore, we conclude that the national government provides de facto a closed-ended matching grant instead of a conditional block grant: the grant is finite and implicitly requires matching.[5]

We think that the situation where recipients do not (fully) use a conditional block grant because of indirect costs is not unique to the case that we

May and Sarson (1999)). In spite of this, federal funded research grants (partly) cover indirect costs. However, it will always be difficult to determine what are legitimate and illegitimate indirect costs. Possibly, this is a reason that many other research grants do not cover indirect costs. In these cases, universities have to pay indirect costs from their own resources. Indirect costs are about 30% of the total costs of research (Goldman, Williams, Adamson, and Rosenblatt (2000)).

[5] Chernick (1979, 1981) also argues that a conditional block grant can implicitly be a matching grant. In his model, recipients apply for a conditional block grant and the donor awards grants to those recipients that are willing to finance a larger part of the project themselves. Therefore, the donor actually provides a matching grant. Chernick also empirically tests this model using the HUD Basic Water and Sewer grant and finds a positive relationship between the size of the grant that recipients receive and their own contribution. Thus, next to implicit costs of using a grant, there can also exist implicit costs of applying for a grant (see also Footnote 3). Also Stein (1979) shows the importance of costs of applying since he finds that communities that apply more often for some specific matching grants, have more active and developed planning structures (e.g., a planning body and a high number of planners). For similar evidence see, for example, Collins and Gerber (2006, 2008) and Hall (2008*a*,*b*), and also Okten and Weisbrod (2000) and Reinhardt (2006).

study. An example of a conditional block grant of the European Union that recipients just use partially, although they would have benefits if they would spend more of it, is the instrument for pre-accession assistance (IPA). In 2010, candidate and potential member states of the European Union use only 82% of the committed amount (this is an underimplementation of 323 million euros) (European Commission (2011*a*)). Also in this case, implicit co-financing might be important. For example, the European Commission (2011*a*, p. 14-15) mentions that recipients do not always have the administrative capacity that is required for receiving grants. Recipients need to develop plans and also need proper (financial) reporting to prove that money is spent on the purpose of the grant. Many universities receive conditional block grants from the European Union as well. The European University Association notes that also these grants regularly require implicit co-financing (Estermann and Pruvot (2011, p. 52)). For example, it can occur that a university can use a grant to build a lecture-hall, but not the accompanying parking space, while the university cannot choose not to build the parking space.[6] To encourage universities to use these European grants, some national governments provide additional grants to universities to cover the indirect costs.[7]

Hickey (2001) provides another example: the underspending of HIV/AIDS conditional block grants by South African provinces. In the financial year 2000−2001, provinces spend only 36.5% of these grants, although HIV/AIDS is a large problem. Also Hickey (2001) mentions a lack of administrative capacity of recipients as a reason for the underspending. Administrative capacity is costly for provinces. Moreover, provinces bear costs that result from fighting HIV/AIDS, but that are too intertwined with regular health costs to use conditional funding to finance them (Hickey (2002, p. 600)). Therefore, provinces incur expenses to use the grant. To cover these costs and thereby address the underspending, South African provinces receive since 2002 an additional unconditional block grant with the request to spend it on HIV/AIDS. Hickey and Ndlovu (2005) argue that due to this additional grant, spending on HIV/AIDS increased drastically.

One more example are funds that support education of employees in spe-

[6] In a similar vein, Cashel-Cordo and Craig (1990) argue that also certain forms of foreign aid and IMF programs look like conditional block grants, but in fact contain an implicit matching component because of, for example, required policy changes that generate additional expenditures for the recipient. See also McGuire (1978), Chubb (1985), Brennan and Pincus (1990), and Singhal (2008) for a discussion on explicit and implicit conditions of grants.

[7] The Canadian government also provides a grant that complements other federal research grants by covering the indirect costs of research (Government of Canada (2010)). For the situation in the United States, see, e.g., the references in Footnote 4.

cific sectors in the Netherlands (so-called O&O funds). Most funds finance costs of courses via conditional block grants to employers (De Mooij and Houtkoop (2005, p. 60)). Although educational programs are beneficial for employers, they do not use a large part of the available amount of money (for financial details see Waterreus (2002) and De Mooij and Houtkoop (2005)). A general explanation for this insufficient use is that employers have implicit costs of using grants, for example, opportunity costs of working, travelling costs, and reluctance of employees to follow courses.

A final example is from organizational economics. General managers often finance departments of their organization via conditional block grants for, among others, conferences and education. In many organizations, departments do not fully use these grants. Obviously, it is for the department and its employees attractive to attend conferences or follow courses, but the implicit cost that the department and its employees have to bear is that it is not possible to do other work at the same time. Therefore, the (implicit) marginal costs can outweigh the marginal benefits and the grant may not be fully spent.

The underlying idea of our approach and findings is related to the aforementioned literature on the fungibility effect. McGuire (1978) argues that a grant that a donor officially labels as conditional can be partly unconditional in practice. Based on data on expenditures of U.S. local governments, he estimates the effect of an educational grant on the local government's budget constraint and he finds that about 70% of the grant is fungible. Hence, McGuire argues that a conditional grant can be even better for a recipient than it looks at first sight. We argue that it is also possible that a recipient has to sacrifice unconditional resources to use a conditional block grant. Therefore, in our case, the grant is less attractive for the recipient than it looks at first sight. Of course, a conditional block grant can be fungible and can require own resources at the same time.

We certainly do not claim that high costs of using a grant is the only reason that conditional block grants are not always fully spent. For example, in our case, policy makers and other parties involved also mention other reasons, like careful budgeting by municipalities (see also Stein (1984)) and disappointing results of programs of which the price depended on job placements (see, e.g., the references in Footnote 2). We think that the existence of costs of using a grant is only one, but a general, explanation for the insufficient use of conditional block grants.

The rest of the paper is organized as follows. Section 2 describes the institutions and deliberates on the revenues and costs of using the grant. Section 3 presents a simple model to analyze the impact of indirect costs on the decision of a municipality to use the grant. Section 4 brings this model to the data and estimates the indirect costs. Finally, Section 5 concludes.

2 Institutions

Municipalities annually receive a conditional block grant for welfare-to-work programs from the national government. The total grant is 1.6 billion euros in 2008.[8] The share of this total that a municipality receives is a function of municipality-specific characteristics (for example, the number of social assistance recipients and their level of education) and its welfare-to-work expenditures in 2003.[9] In 2008, there are 443 municipalities with in total $269,000$ social assistance recipients that are younger than 65 (source: Statistics Netherlands).[10] A welfare-to-work program can be (almost) anything that helps these social assistance recipients to find a job. This help can be schooling or assistance with applications, but also a wage subsidy or even a full-time public service job like a security officer or a cleaner. In 2008, municipalities spend approximately 35% of the total welfare-to-work expenditures on subsidized employment, 25% on job search guidance, 20% on wage subsidies, and 10% on education (Divosa (2009)).[11]

If a welfare-to-work program is successful and a person leaves social assistance, then the gain for the municipality is that it does not have to pay a benefit to this person anymore. The national government finances expenditures of municipalities on social assistance benefits via an unconditional block grant, so the municipality can use the money it saves in any way it wishes. Since municipalities can even directly finance jobs from the grant for welfare-to-work programs, the marginal revenue of spending a euro of this grant is always positive. The expenditures of a municipality have positive externalities since also the national government benefits if a person leaves social assistance. Not only can it lower the aforementioned unconditional

[8] To put this amount in context, in 2008, the total unconditional block grant that municipalities receive for social assistance benefits for people that are younger than 65 equals 3.7 billion euros and the Dutch GDP is 596 billion euros (source: Ministry of Social Affairs and Employment and Statistics Netherlands).

[9] The current system exists since 2004. See, e.g., Ministry of Social Affairs and Employment (2006, 2008) for background information.

[10] Many employees that lose their job can claim unemployment insurance first (the maximum duration of this benefit is individual-specific and varies between 3 months and 5 years during the sample period). Therefore, relatively many social assistance recipients are already unemployed for a longer period.

[11] For an overview of the literature on evaluations of active labor market policies see, e.g., Card, Kluve, and Weber (2010) and Kluve (2010).

block grant that it gives a municipality for social assistance benefits in the long run, but it also receives income taxes and more indirect taxes. Moreover, it saves on many other income dependent subsidies like, for example, rent subsidies, health care subsidies, and student grants.

A municipality can use the grant for welfare-to-work programs to finance a program.[12] However, this conditional block grant only covers a part of the costs. The total costs consist of direct and indirect costs. Direct costs are the costs of the actual program that an individual participant receives, like the amount of wage subsidy or the course fee. Indirect costs are all other costs. For example, a municipality incurs expenses for selecting social assistance recipients for which a program is useful ("profiling"), for finding a right program for these candidates ("targeting"), for procurement of a program, and for monitoring program participants and the company that carries out the program (see Berkhout and Mallee (2008)). Moreover, it also has more general indirect costs like maintenance of the building in which civil servants work. A municipality can use the grant for direct costs, but not for indirect costs. Since the grant is conditional, the national government wants a municipality to prove that it really uses the grant for welfare-to-work programs. A municipality has to assign costs to an individual program participant to use the grant. It can easily do this for direct costs, but this is difficult for indirect costs. Therefore, it has to finance indirect costs from its own resources. The national government cannot sufficiently distinguish indirect costs from costs that do not result from welfare-to-work programs to allow municipalities to use the conditional block grant to finance them. If a municipality could also use the grant for indirect costs, then the grant would not be conditional.[13]

If a municipality does not (fully) use the grant for welfare-to-work programs, it can save a part of the grant for future years. However, the total

[12] Next to the standard grant from the national government, a municipality may receive additional conditional grants for welfare-to-work programs (for example, via the European Social Fund). Van Geuns, Mallee, Soethout, Van Waveren, and Wissink (2006, p. 22) estimate that the size of these grants is 5% to 6% of the grant a municipality receives from the national government and that 40% to 50% of the municipalities receive such a grant. In our analysis, we assume that the grant of the national government is the only grant a municipality receives (since this is the only grant that we observe).

[13] The national government also gives an annual unconditional block grant for all kinds of general expenditures like roads and the fire department (the so-called municipality fund). It labels a part of this grant for the indirect costs of social assistance and welfare-to-work programs, although it does not know these costs exactly (see Ministry of Social Affairs and Employment (2008, p. 36)). In 2008, this part is in total 1.5 billion euros (Cebeon (2010, p. 10)). See, e.g., Kok, Hollanders, and Hop (2006, p. 17), Kuhry and Jonker (2007, p. 89), and Cebeon (2010) for a discussion and estimations of indirect costs.

savings can never exceed 75% of the current grant. Any remaining money flows back to the national government. Similarly, if a municipality spends more than the grant, it can transfer these expenditures to future years. These borrowings can in total never be larger than 75% of the current grant. A municipality has to pay any remaining deficits from its own resources.[14]

3 Theory

In this section, we study the expenditure level that a municipality chooses when it receives the conditional block grant. We show that if the indirect costs of programs are sufficiently high, then it is optimal for a municipality not to fully use the grant.

We model the relation between the national government and one municipality (the national government has with each municipality such a relation). In reality, a municipality can move parts of the grant back and forth in time (see Section 2). To clearly present the effects, however, we assume a static setting in this section. The municipality can (partially) use the grant or it can (partially) give it back. Later on, we allow for saving and borrowing. Moreover, we assume that the municipality cares only about its own revenues and costs, while the national government cares about the revenues and costs of itself and the municipality. In practice, the national government finances the municipality for the most part (Allers (2009)). Furthermore, if the municipality would care about the national government like it cares about itself, then a conditional grant would not be necessary since the municipality would already take the decision that the national government wishes without any incentive. Finally, to keep the model simple, we assume in this section that the national government's estimate of the indirect costs (see Footnote 13) is correct.[15] We do not make any assumption on the knowledge of the national government regarding the indirect costs in the empirical part of the paper.

The total revenues (TR) and marginal revenues (MR) of expenditures on welfare-to-work-programs are for the national government (ng) and municipality (m) respectively:

[14] Each month, the national government transfers a twelfth of the annual grant to a special checking account. A municipality can transfer money from this account to its regular accounts. The special checking account cannot have a negative balance. If a municipality borrows, then it has to temporarily finance this amount. In our analysis, we assume that a municipality does not receive interest on its savings and that it does not pay interest on its borrowings.

[15] An alternative assumption in this section could be that the national government ignores the indirect costs. This assumption is less realistic and leads sooner to the conclusion that underspending exists. We will come back to this point in Footnote 18.

$$TR_{ng} = \alpha \log (U+1) \qquad MR_{ng} = \frac{\alpha}{U+1}$$
$$TR_m = \beta \log (U+1) \qquad MR_m = \frac{\beta}{U+1}$$

where U is the amount of money the municipality spends on actual welfare-to-work-programs ($U \geq 0$). These expenditures have decreasing returns. The effect of 1 euro of programs on the probability that a person leaves social assistance differs between social assistance recipients. The municipality first spends money on recipients for which the probability increases a lot, then on recipients for which the effect is smaller. The national government gains more from expenditures than the municipality (see Section 2). Therefore, $\alpha > \beta > 0$. Spillover benefits are larger at lower expenditure levels. Social assistance recipients for which the effect of 1 euro of programs is larger, also give higher additional revenues to the national government. Their expected income rises more after spending the euro than the expected income of persons of which the euro has a smaller effect. Thus, the expected increase in tax payments of these persons is larger, just like the expected decrease in their need for income dependent subsidies.

The total costs (TC) and marginal costs (MC) of welfare-to-work programs are:

$$TC = (1+x)\,U \qquad MC = (1+x)$$

The total costs consist of the costs of the actual programs (direct costs, U) and indirect costs of programs (xU) (see Section 2). We assume that indirect costs are a fraction x of the costs of actual programs ($x \geq 0$).[16] The municipality chooses its spending on actual programs such that $MR_m = MC$ and as a result $U^* = (\beta/(1+x)) - 1$. However, the national government wants that the municipality chooses U such that $MR_{ng} = MC$, which corresponds to $U_{ng} = (\alpha/(1+x)) - 1$. Thus, the national government wants that the municipality spends more than what it currently does ($U_{ng} > (\beta/(1+x)) - 1$). To accomplish an increase, it gives the municipality a conditional block grant

[16] Alternatively, we could assume that the indirect costs depend on the level of U. However, it is a priori not clear what this relation would be. In practice, it seems that some types of indirect costs are higher if a municipality already has spent a lot on actual programs (e.g., it is harder to find a new appropriate participant). Other types of indirect costs, however, may be lower in this case (e.g., civil servants have more experience in the procurement of programs). Furthermore, a more complex cost function substantially increases the required number of computations in the next section. For these reasons, we assume that indirect costs are a constant fraction of U. Another possibility is the existence of (indirect) fixed costs. These do not impact the conclusions in this section. In the empirical part of the paper, one of our estimates is robust to the existence of (indirect) fixed costs.

G for welfare-to-work programs ($G \geq 0$). Since the grant is conditional, the municipality can only use the grant for expenditures of which it can prove that it incurs these for the purpose of the grant. Therefore, the municipality can only use the grant to finance expenditures on actual programs, not to finance indirect costs (see Section 2). As a result, the total and marginal costs of the municipality are now:

$$TC_m^G = xU + (U - G)\, I_{U>G} \qquad MC_m^G = \begin{cases} x & \text{if } U \leq G \\ 1 + x & \text{if } U > G \end{cases}$$

where $I_{U>G}$ is an indicator function taking the value 1 if its argument is true and 0 otherwise. If $U \leq G$, the municipality's marginal costs of U equal the indirect costs. It uses the grant to cover the costs of actual programs. If $U > G$, then the municipality already exhausted the grant and its marginal costs of U equal the costs of the actual programs plus the indirect costs.[17] The national government sets $G = U_{ng}$. Hereafter, we will prove that this level of the grant is optimal for the national government.

Figure 1 depicts the marginal revenues and marginal costs of both the national government and the municipality at varying levels of U. The level of U that the municipality chooses, and thus also whether it uses the grant completely, depends on the level of the indirect costs. If the indirect costs are 0 or relatively low, then the municipality uses the whole grant. However, if the indirect costs are relatively high, then the municipality does not use the whole grant.

We define $\tilde{x}$ as the highest level of the indirect costs at which the municipality still uses the whole grant. That is, the level of x at which $MR_m = MC_m^G$ and $U = G$:

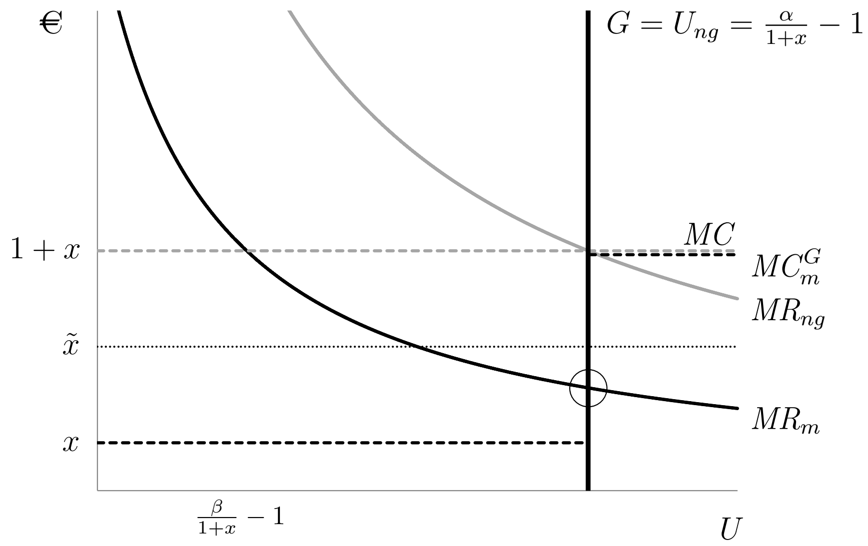
$$\frac{\beta}{G+1} = x \tag{1}$$

$$\tilde{x} = \frac{\beta}{\alpha - \beta}$$

Now, we can distinguish two scenarios. First, we consider the scenario where $x \leq \tilde{x}$. Figure 1 shows this situation. In this case, the municipality chooses

[17] We could also explicitly divide the indirect costs of programs into two types: indirect costs that also exist if the municipality uses its own resources instead of the grant (e.g., costs of selecting program participants) and indirect costs that only exist if the municipality uses the grant (e.g., administrative costs of proving that money is spent on the purpose of the grant). In this section, we assume for simplicity that all indirect costs are of the first type (i.e., the indirect costs are not higher if the municipality uses the grant than if it uses its own resources). In practice, the first type of costs seem to be much larger than the second type. In the empirical part of the paper, we implicitly include both types of costs.

Figure 1: The municipality fully spends the grant if indirect costs are relatively low ($x \leq \tilde{x}$)



$U^* = G$. The municipality does not spend more than G on actual programs if (see also Figure 1):

$$\frac{\beta}{G+1} \leq 1 + x \tag{2}$$

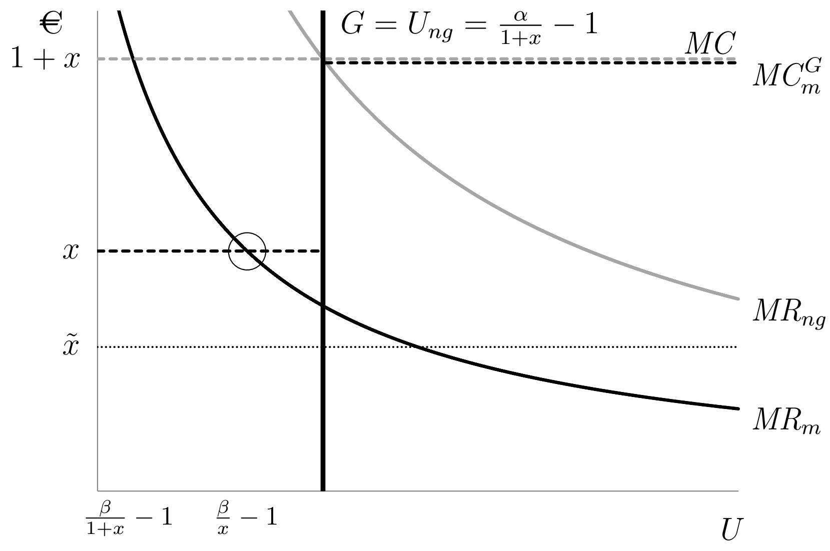
This condition always holds since it is equivalent to $\alpha \geq \beta$. More intuitively, G is the optimal level of spending on actual programs for the national government. Since the municipality has lower marginal revenues than the national government, it is never optimal for the municipality to choose a higher amount than G if it has to bear the full marginal costs.

The municipality spends more on actual programs than it would do in the situation without a grant ($G > (\beta/(1+x)) - 1$). In fact, if the indirect costs are 0 or relatively low, the municipality chooses the amount that the national government wants ($G = U_{ng}$) and it uses the grant completely:

$$\textit{fraction spent} = \frac{U^*}{G} = 1 \qquad \text{if } x \leq \tilde{x}$$

Second, we consider the scenario where $x > \tilde{x}$. Figure 2 shows this scenario. The municipality chooses U such that $MR_m = MC_m^G$. As a result, $U^* = (\beta/x) - 1$. Although this amount is higher than the amount the municipality would choose if there would not be a grant $((\beta/x) - 1 >$

Figure 2: The municipality does not fully spend the grant if indirect costs are relatively high ($x > \tilde{x}$)



$(\beta/(1 + x)) - 1)$, it is lower than the amount that the national government wants. The municipality does not use the whole grant if indirect costs are relatively high:

$$fraction\ spent = \frac{\frac{\beta}{x} - 1}{G} = \frac{\frac{\beta}{x} - 1}{\frac{\alpha}{1+x} - 1} < 1 \qquad \text{if } x > \tilde{x}$$

Because the indirect costs are higher than in the first scenario, the national government wants fewer programs and thus it lowers the grant (see Figure 2). However, programs are also less attractive for the municipality in this scenario. The decrease that the municipality wants is even larger than the decrease that the national government wishes. As a result, the municipality does not use the whole grant anymore. Moreover, as indirect costs become larger, the municipality uses a smaller part of the grant. More formally,

$$\frac{\partial(fraction\ spent)}{\partial x} < 0 \qquad \text{if } x > \tilde{x}$$

Intuitively, a decrease in the municipality's spending on actual programs costs the national government more than the municipality (in Figure 2, MR_{ng} is steeper than MR_m given a certain level of U). Therefore, if for both marginal costs rise by the same amount (that occurs if x rises), then the national government wants to decrease the spending on actual programs less than the municipality. The grant decreases less than the expenditures of the municipality on actual programs. Consequently, the part of the grant that the municipality uses decreases.[18]

What basically causes that the municipality does not fully use the grant, is that the nature of the grant changes if there exist costs of using it. The conditional block grant becomes in fact a closed-ended matching grant. The national government finances only a part of the total costs of the municipality. Moreover, it specifies beforehand the maximum amount that it will contribute.

Anyhow, the grant has the effect that the national government desires. The municipality increases its expenditures compared to the situation without the grant. Moreover, it never spends more than what the national government wants.[19] Appendix A shows that the current level of the conditional block grant is optimal for the national government. The expenditure level that the municipality chooses at a different level of the grant differs at least as much from the expenditure level that the national government wishes as the current expenditure level. The national government could solve the insufficient use of the grant in case of $x > \tilde{x}$ by giving a closed-ended matching grant of $(1 + x)$ euros for every euro that the municipality spends on actual programs. The maximum contribution of the government should equal $(1 + x)\, U_{ng}$.[20]

[18] If we would assume that the national government ignores the indirect costs (see Footnote 15) while these costs do exist, then the national government would underestimate the costs of programs and provide a larger grant. In that case, the municipality already would not fully use the grant at a lower level of x ($\tilde{x}$ would be lower). Hence, the assumption that the national government ignores the indirect costs leads sooner to the conclusion that underspending exists than the assumption that its estimate of the indirect costs is correct.

[19] The national government can compensate the crowding out of expenditures that the municipality would do if there would not be a grant $((\beta/(1 + x)) - 1)$ by decreasing the unconditional block grant for general expenditures (see Footnote 13) by this amount.

[20] In reality, such a design might have a negative effect for the national government that does not exist in our simple model. In the model, every euro that the municipality spends on actual programs has the same indirect costs. Consequently, the municipality first chooses the euro of programs with the highest revenue (like the national government wants). However, if not every euro of programs has the same indirect costs (e.g., it requires little effort for the municipality to provide an additional, but not effective, educational program to a participant), then there is also an incentive for the municipality to choose a euro of programs with low indirect costs and gain the difference between the reimbursed indirect costs (x) and the real indirect costs.

4 Empiricism

In this section, we estimate municipalities' indirect costs of welfare-to-work programs. In the first subsection, we describe our data set and present descriptive statistics. We bring the model from the previous section to the data in the second subsection. In the third subsection, we present the results. We perform a robustness check in the fourth subsection.

4.1 Data and descriptive statistics

The Ministry of Social Affairs and Employment provided data on the grant for welfare-to-work programs that a municipality annually receives and how a municipality uses this money. We know the amount that a municipality spends, how much it saves (or borrows), and the amount it gives back to the national government.[21] We have data for each municipality in the Netherlands over the period $2004 - 2008$. Via Statistics Netherlands we obtained annual municipality-specific data on the outflow from social assistance and the population for the period $2004 - 2009$ (both variables only contain people aged between 20 and 65). During the sample period, some municipalities cooperate regarding their welfare-to-work activities (in the period $2004 - 2006$, there exist 16 partnerships of 64 mostly smaller municipalities (see Koning (2009)). If two or more municipalities cooperate in a certain year, we consider these municipalities as one decision maker and add their data for this year. Moreover, some municipalities merge during the sample period. Until the actual merger, we treat the merging municipalities as separate.

First, we present some descriptive statistics. For each municipality i in year t, we divide its expenditures on actual programs ($U_{i,t}$), its savings (or borrowings) ($S_{i,t}$), and the amount it returns to the national government ($T_{i,t}$) by the grant it receives ($G_{i,t}$). Figure 3 shows the results for 2006. Figure B1, B2, B3, and B4 in Appendix B show the results for the other years. Table 1 contains summary statistics. The figures show that many municipalities do not use a substantial part of the grant they receive. For example, in 2006, municipalities spend on average only 80% of the grant.

[21] Possibly, municipalities also spend money from their own resources on actual welfare-to-work programs. We do not observe these possible additional expenditures. However, for a municipality there seems no reason to use its own resources if it has savings or if it can still borrow. Table 1 shows that most municipalities have savings. Moreover, in Section 3, we show that in theory a municipality never wants to spend more than the grant. Therefore, we assume that municipalities do not spend money from their own resources on actual programs (compare this assumption with Moffitt (1984)).

Figure 3: Expenditures ($U_{i,t}$), savings (or borrowings) ($S_{i,t}$), and the amount returned ($T_{i,t}$) divided by the grant received ($G_{i,t}$) for each municipality in 2006

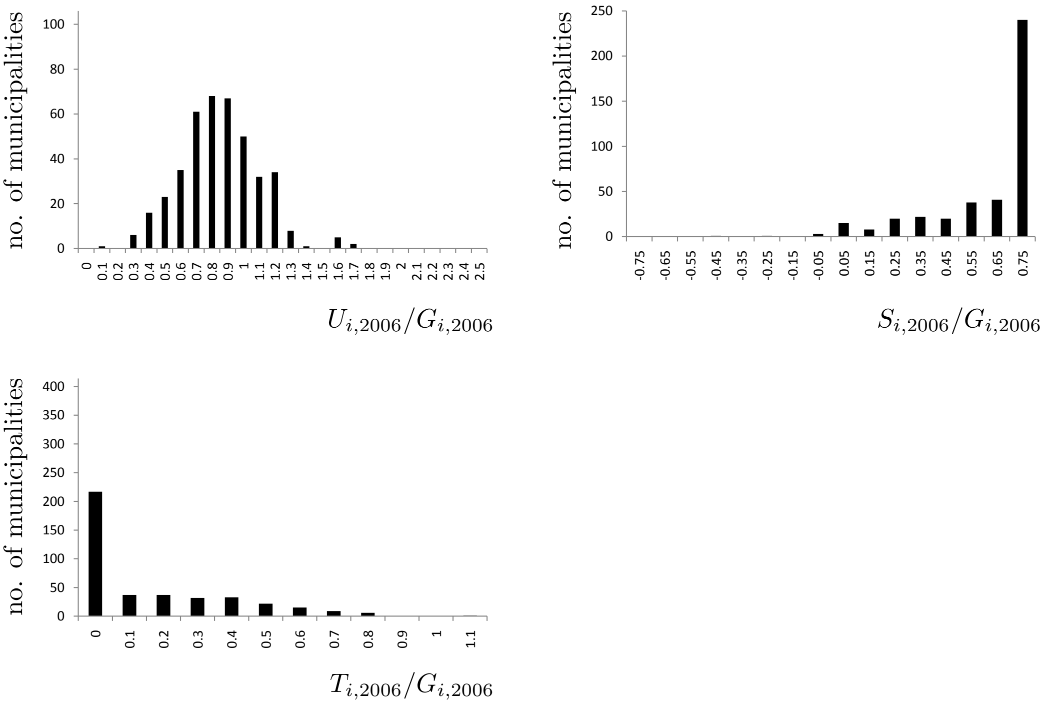


Figure 3 shows that there exist substantial differences between municipalities, indicating that many municipalities spend less.[22]

The third and fifth row of Table 1 show that each year almost all municipalities save and almost no municipalities borrow. In 2006, 397 out of 409 municipalities save and 12 borrow. Savings are substantial and increase during the first years. Almost half of the municipalities save the maximum allowed amount of 75% of the grant in 2006, while in 2004 about 10% of the municipalities save this amount (see Table 1).[23] The second row of Ta-

[22] The annual amounts that a municipality spends, saves, and returns do not necessarily add up to the grant it receives in that year since it may have savings from the past and/or it may borrow from the national government. Hence, in a certain year, a municipality can spend more than the grant it receives. Moreover, a municipality can return more than the grant if its grant decreases compared to the previous year. In that case, it can save less than in the previous year and therefore it is possible that it returns both the new grant and a part of its savings from the past.

[23] Most municipalities have some savings from 2003 (the final year of the previous

Table 1: Summary statistics

	year				
	2004	2005	2006	2007	2008
no. of municipalities	461	429	409	442	434
average of $U_{i,t}/G_{i,t}$	0.81	0.75	0.80	0.92	0.98
no. of municipalities w. $S_{i,t} > 0$	440	418	397	412	398
no. of municipalities w. $S_{i,t} = 0.75G_{i,t}$	47	141	192	200	149
no. of municipalities w. $S_{i,t} < 0$	21	11	12	30	36
no. of municipalities w. $T_{i,t} > 0$	47	140	192	200	148
average of $T_{i,t}/G_{i,t}$ if $T_{i,t} > 0$	0.16	0.25	0.29	0.30	0.31

Note: The number of municipalities differs between years because of mergers and (temporal) partnerships.

ble 1 shows that on average municipalities' expenditures increase over the years. Municipalities spend on average 98% of the grant in 2008 (although Figure B4 in Appendix B shows that still many municipalities do not fully use the grant). One possible reason for the increase in expenditures over time may be that for many municipalities it is not possible anymore to save additional money in later years. However, municipalities do not only decide to spend the grant in case saving is not possible. The figures show that many municipalities return money to the national government as well. In 2006, almost 50% of the municipalities return money. The figures also show that if a municipality returns money, then it can be a substantial part of the grant. For example, this part is on average 29% of the grant in 2006 (see the sixth and seventh row of Table 1).

Thus, many municipalities do not fully spend the grant, but instead choose to partially save it and/or partially give it back. Apparently, for these municipalities the profit of spending the final euro of the grant is lower than the profit of saving this euro or giving it back. It is a priori not clear, however, whether a municipality saves with the intention to use it in the future or whether a municipality saves just because it did not reach the maximum allowed amount of savings yet (a municipality only returns the grant if it is not possible to save anymore). In our first estimation of the indirect costs of programs, we aim to make a distinction between these two motives of saving and thus (implicitly) attach a value to savings (and borrowings). This

system), but these are for most municipalities much lower than the maximum allowed amount of savings in 2004.

setting is dynamic. Afterward, we estimate as a robustness check indirect costs in a static setting by using the fact that saving a euro is not possible anymore if a municipality already saves the maximum amount. In this case, the value of savings does not impact a municipality's marginal decision.

4.2 Setup

We adapt the model from Section 3 and model the decision of the municipality such that it can transfer money between years via saving and borrowing. In this setup, a municipality can use a euro of the grant in three ways. First, it can spend the euro. The gain of spending is that people leave social assistance, but the cost is that the municipality has to pay the indirect costs of programs from its own resources. Second, it can save the euro. In this case, the gain is that the municipality can spend the euro in the future and later expenditures may have a higher yield due to, for example, different economic circumstances. Saving has no costs (similarly, a municipality can at no cost borrow a euro to take advantage of a possible high current yield). Third, it can give back the euro. In this case, there are no revenues and no costs.

The total revenues of expenditures on welfare-to-work programs of municipality i in year t are:

$$TR_{i,t} = \mathit{benefit}_t \cdot \mathit{length} \cdot Z_{i,t} \tag{3}$$

where $Z_{i,t}$ is the number of persons that leave social assistance in municipality i in year t due to its spending of $U_{i,t}$ on actual welfare-to-work programs ($U_{i,t} \geq 0$). Moreover, $\mathit{benefit}_t$ is the amount of social assistance one recipient receives in year t and *length* is the average number of years that a person leaves social assistance. Thus, the total revenues are simply the amount of money that a municipality saves on social assistance after spending $U_{i,t}$.[24] We specify $Z_{i,t}$ as follows:

$$Z_{i,t} = \mathit{pop}_{i,t} \cdot \beta_t \cdot \log\left(\frac{U_{i,t}}{\mathit{pop}_{i,t}} + 1\right)$$

where $\mathit{pop}_{i,t}$ is the population of municipality i in year t and β_t measures how effective expenditures on actual programs are in year t. Since effectiveness can differ between years, it may be attractive to save or borrow. Expenditures

[24] A municipality may also provide additional income support (e.g., local tax waivers, discounts on local services, and additional benefits for certain expenditures). We do not take this support into account since it is often for everyone with a low income and a person may still receive it after leaving social assistance. Moreover, the extent of this support is relatively small.

on programs have diminishing returns. We assume that expenditures only impact outflow in the current year. This assumption seems realistic for some types of programs (e.g., assistance with applications, wage subsidies, and the creation of jobs), but may not be fully realistic for other types (e.g., education). However, the relation between current expenditures and future outflow is a priori unclear. On the one hand, the relation might be positive because of long-term effects of programs. On the other hand, the relation can be negative if programs have locking-in effects (that is, program participants decrease their efforts to find a job during the program) (see, e.g., Van Ours (2004) and Ministry of Social Affairs and Employment (2008)). We implicitly assume that these two effects cancel each other out (hereafter, we check this assumption and it turns out that one effect does not always dominate the other).

The total costs of welfare-to-work programs of a municipality are:

$$TC_{i,t} = x_i U_{i,t}$$

where x_i, the indirect costs of 1 euro of actual programs, differs between municipalities. The profit of municipality i (Π_i) over the period $2004 - 2008$ is:

$$\Pi_i = \sum_{t=2004}^{2008} \frac{1}{(1+r)^{t-2004}} \left(TR_{i,t} - TC_{i,t} \right) + \frac{y}{(1+r)^{2009-2004}} \left(S_{i,2008} \right)$$

where r is the discount rate. The profit consists of the difference between the total revenues and total costs over the period $2004 - 2008$ and the value of the savings in 2008. The value of these savings is the gain of spending them after 2008 (or in case $S_{i,2008} < 0$, it is the future gain that the municipality sacrifices by borrowing). The parameter y determines this value. A municipality wants to maximize its profit given its budget constraint. The budget constraint is:

$$G_{i,t} + S_{i,t-1} = U_{i,t} + S_{i,t} + T_{i,t}$$

where $0.75G_{i,t} \geq S_{i,t} \geq -0.75G_{i,t}$ and $S_{i,2003}$ is a constant. Moreover, $T_{i,t} \geq 0$.

We estimate the indirect costs of 1 euro of actual programs in three steps. First, we set values for the parameters $benefit_t$, *length*, and r and estimate the effectiveness of expenditures on actual programs (β_t). Second, we estimate the indirect costs of a municipality by evaluating numerically at which level of x_i the optimal choice of a municipality is most similar to the real choice. Finally, our estimate of the indirect costs equals the average over all municipality-specific x_i's.

4.2.1 Parameter values

First, we set values for $\textit{benefit}_t$, *length*, and r. We determine the value of $\textit{benefit}_t$ by dividing the total expenditures on social assistance benefits in year t by the average of the number of people that receive social assistance on the first and last day of that year (sources of these data are, respectively, the Ministry of Social Affairs and Employment and Statistics Netherlands). This value is $12,494$ euros in 2008. We set *length* at 4 years. We know that 25% (37%) of the population that enters social assistance also received social assistance in the previous year (previous 2 years) (data from Statistics Netherlands, see Inspectie Werk en Inkomen (2006) and Bierings and Michiels (2010)). Therefore, we approximate the probability that a person leaves social assistance and becomes a recipient again in the future by an exponential density function with a constant hazard function of 0.25 (value of the CDF(year=1)=0.22, value of the CDF(year=2)=0.39). As a result, the expected moment of inflow is 4 years after the moment of outflow (= 1/0.25). The discount rate r is 0.05. Later on, we will also consider other values.

Second, we estimate β_t via the following equation:

$$\frac{\textit{outflow}_{i,t}}{\textit{pop}_{i,t}} = \gamma_i + \delta_t + \beta_t \cdot \log\left(\frac{U_{i,t}}{\textit{pop}_{i,t}} + 1\right) + \epsilon_{i,t} \tag{4}$$

where $\textit{outflow}_{i,t}$ is the outflow from social assistance in municipality i in year t. The outflow that municipality i would have in year t in case it would not spend anything on actual programs is the sum of the municipality-specific fixed effect γ_i and the time-specific fixed effect δ_t (multiplied with its population). We estimate Equation (4) via the two-way Within estimator.

Table 2 presents the main estimation results. The first column shows that the yield of expenditures differs between years. The estimated coefficient for 2006 is about three times larger than the coefficient for 2008. The second column presents the estimation results in case we do not include a year-specific coefficient for the yield ($\beta_t = \beta$). A Wald test rejects equality of the point estimate of this pooled coefficient and the coefficient for 2006 (2008) at the 5% (10%) significance level. To illustrate the results, Figure 4 shows the relation between expenditures on actual welfare-to-work programs ($U_{i,t}$) and the additional outflow that they cause ($Z_{i,t}$) for a municipality with $80,000$ inhabitants. For example, this municipality would have an additional outflow of 416 people if it would spend 7.5 million euros on actual programs in 2006. If it would spend the same amount in 2008, only 143 persons would leave social assistance. Furthermore, if this municipality already spent 7.5 million euros in 2006 and if it wants one additional person to leave social assistance in this year, then this would cost about $83,000$ euros. Thus, we find that the

Table 2: Estimation results Equation (4)

	dependent variable: $outflow_{i,t}/pop_{i,t}$	
	year-specific coefficients	pooled coefficient
β_{2004}	0.60 (0.22)***	
β_{2005}	0.73 (0.20)***	
β_{2006}	1.14 (0.22)***	
β_{2007}	0.82 (0.24)***	
β_{2008}	0.39 (0.19)**	
β		0.70 (0.19)***

Notes for Table 2, 3, and 4: For all regressions, $N = 516$, $T = 5$, and the number of observations is $2,185$, except for the regression in the first column of Table 3 where $N = 491$, $T = 5$, and the number of observations is $2,125$. Estimated coefficients are multiplied with $1,000$ in Table 2 and 3 and with $100,000$ in Table 4. Standard errors that are robust to heteroskedasticity and serial correlation are between brackets. Pesaran's CD test cannot reject the null of no cross-sectional dependence in the residuals at the 5% significance level. In these tables, * denotes 10% significance level, ** denotes 5% significance level, and *** denotes 1% significance level. Municipality-specific fixed effects and year-specific fixed effects are not reported.

Figure 4: Expenditures on actual programs ($U_{i,t}$) and the additional outflow they imply ($Z_{i,t}$) for a municipality with $80,000$ inhabitants

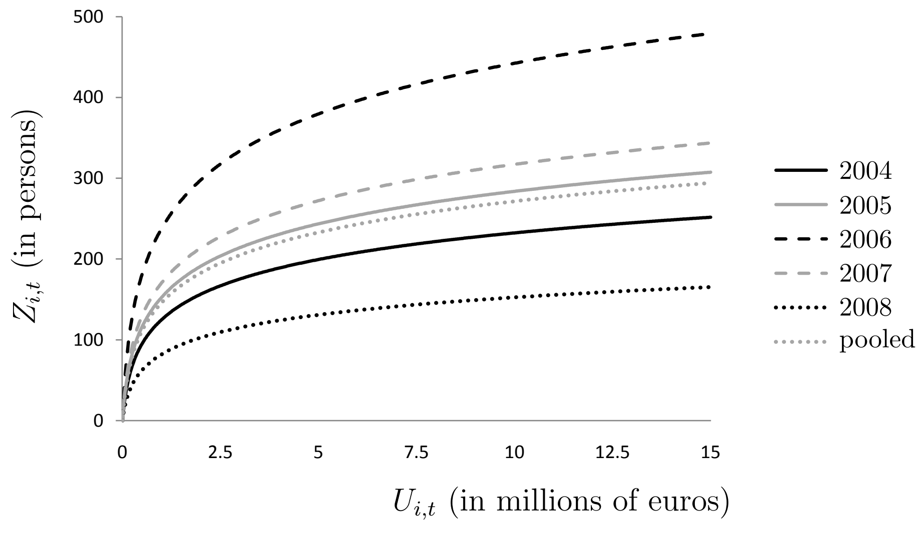


Table 3: Robustness of estimation results (part 1)

	dependent variable: $outflow_{i,t+1}/pop_{i,t}$	dependent variable: $outflow_{i,t}/pop_{i,t}$
		$\gamma_{i,2004-2006}$ and $\gamma_{i,2007-2008}$
β_{2004}	-0.04 (0.25)	0.48 (0.52)
β_{2005}	0.35 (0.20)*	0.59 (0.41)
β_{2006}	-0.03 (0.18)	1.16 (0.41)***
β_{2007}	-0.46 (0.21)**	0.79 (0.45)*
β_{2008}	-0.87 (0.18)***	0.35 (0.38)

yield differs between years. This difference can explain that municipalities save.

Table 3 presents some robustness checks. The first column reports the effect of expenditures on outflow in the next year. Remember that from a theoretical perspective the relation between current expenditures and future outflow can be both positive and negative. The results show that expenditures in 2005 have a positive impact on outflow in 2006 (the positive effect of programs dominates), while expenditures in 2007 and 2008 have a negative impact on next year's outflow (the locking-in effect dominates). One effect does not always dominate the other effect. To control for a possible change in the municipality-specific trend in the outflow after 2006, we perform a regression with 2 municipality-specific effects: one for the period $2004-2006$ and one for the period $2007-2008$. The second column of Table 3 reports similar coefficients (with larger standard errors) as in case of 1 municipality-specific effect (the first column of Table 2).

As a final robustness check (and to get coefficients with a simple interpretation), we change the functional form of Equation (4). We replace the term $\log\big((U_{i,t}/pop_{i,t})+1\big)$ by the term $\big(U_{i,t}/pop_{i,t}\big)$. The first column of Table 4 shows the estimation results. The pattern in the yield, which partly determines in which years it is attractive to save and spend, does not change. Like in the basic specification, the yield is gradually increasing during the period 2004-2006 and declines gradually after 2006. The second column of the table shows the results in case of a pooled coefficient. The interpretation of this coefficient is straightforward: it costs on average about $98,000$ euros on actual programs to let one person leave social assistance ($= 100,000/1.02$). A back-of-the-envelope calculation based on this result indicates that municipalities

Table 4: Robustness of estimation results (part 2)

	dependent variable: $outflow_{i,t}/pop_{i,t}$ explanatory variable: $U_{i,t}/pop_{i,t}$	
	year-specific coefficients	pooled coefficient
β_{2004}	1.28 (0.31)***	
β_{2005}	1.55 (0.32)***	
β_{2006}	1.97 (0.36)***	
β_{2007}	1.27 (0.31)***	
β_{2008}	0.79 (0.24)***	
β		1.02 (0.26)***

recover about 50% of their expenditures on actual programs:

$$\frac{revenues}{costs} = \frac{\overline{benefit} \cdot length \cdot 1}{(100,000/1.02)} = 0.50 \tag{5}$$

where $\overline{benefit}$ is the average of $benefit_t$ during the sample period. This finding is in line with studies that use detailed microdata to evaluate the effectiveness of programs in the Netherlands (see Kok, Hollanders, and Hop (2006) and CPB Netherlands Bureau for Economic Policy Analysis (2007)). In fact, policy makers also use this number for fiscal projections (Inspectie der Rijksfinanciën (2010)).

4.3 Estimation of the indirect costs

We know all parameters of the model from Section 4.2, except x_i and y. Our interest is the average value of x_i and we find this value by numerically solving the model. We know the decisions of each municipality on $U_{i,t}$, $S_{i,t}$, and $T_{i,t}$ during the sample period. We look for each municipality at which level of the indirect costs these decisions maximize the municipality's profit. This level is the estimated x_i of a municipality (x_i^e). Subsequently, we take the average of x_i^e over all municipalities.

First, we set $y = 0.5$. This number means that the contribution of the savings at the end of the sample ($S_{i,2008}$) to the profit is 50% of their value. Our back-of-the-envelope calculation shows that this percentage is approximately the municipality's return on money spent on actual programs (see Equation (5)). Hereafter, we study to what extent our results depend on the value of y (it turns out that it does not matter much).

Second, we take a municipality and construct paths of possible choices of $U_{i,t}$, $S_{i,t}$, and $T_{i,t}$ during the period $2004 - 2008$. For each year, we calculate the maximum that this municipality can spend. This number is the sum of the grant it receives, its balance from last year, and the maximum amount that it can borrow. The municipality spends a fraction $m_{i,t}$ of this amount:

$$U_{i,t} = m_{i,t} \left(G_{i,t} + S_{i,t-1} + 0.75 G_{i,t} \right)$$

where $m_{i,t}$ is a value from the set $\{0, 0.05, 0.1, ..., 1\}$ (21 different values). When a municipality chooses $U_{i,t}$, it also chooses the amount it borrows or does not spend. If it borrows ($U_{i,t} > G_{i,t} + S_{i,t-1}$), then $S_{i,t}$ is the deficit and $T_{i,t} = 0$. In case money remains ($U_{i,t} < G_{i,t} + S_{i,t-1}$), saving it always gives a higher profit than giving it back (both have no costs, but saving has a possible revenue). Therefore, we only consider returning money as an option if it is not possible anymore to save. If the amount of money that remains after spending is equal to or less than $0.75G_{i,t}$, then it is fully saved and $T_{i,t} = 0$. If the amount of money that remains is more than $0.75G_{i,t}$, then $S_{i,t} = 0.75G_{i,t}$ and $T_{i,t}$ is what remains after spending and saving. As a consequence, when the municipality sets $U_{i,t}$, the values of $S_{i,t}$ and $T_{i,t}$ follow by definition. Therefore, in each year, the municipality can divide the available amount of money in 21 different ways over $U_{i,t}$, $S_{i,t}$, and $T_{i,t}$. The available amount in year t depends on decisions in previous years. Hence, for the 5-year period, there exist 21^5 ($= 4,084,101$) paths of possible choices.

Third, we set $x_i = 0$. In this case, there are no indirect costs for the municipality. Given this x_i, we calculate the profit of all constructed paths that the municipality can choose. The path with the highest profit is the optimal decision for the municipality if $x_i = 0$. We also calculate the optimal decision in case one of the other values from the set $\{0, 0.1, 0.2, ..., 4\}$ is the value of x_i. The set's upper limit of 4 implies that a municipality has to add at most 4 euros from its own resources to use 1 euro of the grant. For each of the 41 possible values of x_i, we have at least one path that would be optimal for the municipality if this value of x_i would be the real value (it is possible that several paths generate the same maximum profit).

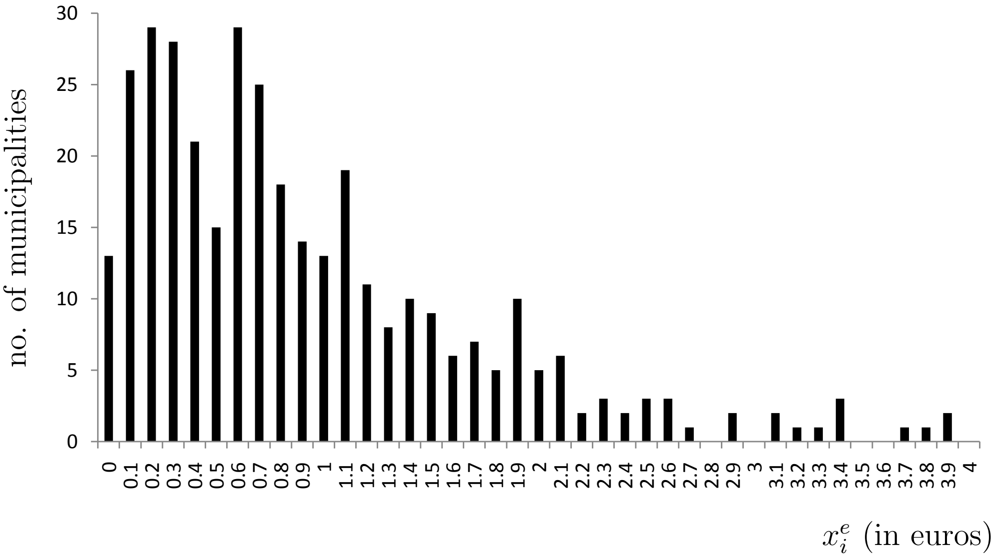
Fourth, we look which one of these (at least 41) optimal paths is most similar to the real decisions of the municipality. The x_i associated with this path is the estimate of the indirect costs of this municipality. Formally,

$$x_i^e = \arg\min_{x_i} \sum_{t=2004}^{2008} \left(U_{i,t} - U_{i,t}^* \mid x_i \right)^2 + \left(S_{i,t} - S_{i,t}^* \mid x_i \right)^2 + \left(T_{i,t} - T_{i,t}^* \mid x_i \right)^2 \quad (6)$$

If there are several optimal paths that are equally similar to the real decisions, then x_i^e is the average of the x_i's associated with these paths.

Fifth, we perform the analysis for all other municipalities of which the

Figure 5: The distribution of the estimated indirect costs of using 1 euro of the grant (x_i^e) if the value of the savings in 2008 equals 50% ($y = 0.5$)



data cover the full sample period (354 municipalities in total).[25] Figure 5 shows the distribution of x_i^e. The set's upper limit of 4 seems sufficient. For most municipalities, x_i^e is larger than 0. The average x_i^e ($\bar{x}^e$) is 0.93. This number is the estimate of the indirect costs if $y = 0.5$.[26]

Finally, we repeat the complete analysis with each other value of y from the set $\{0, 0.25, 0.5, ..., 2\}$. Thus, the value of $S_{i,2008}$ is at least 0% and at most 200%. Higher values do not seem realistic. The first column of Table 5 reports the results. The 9 different values of y do not cause a large variation in the estimated indirect costs, although $\bar{x}^e$ is somewhat higher for lower values of y (in general, this is also true for x_i^e). If $y = 0$, then $\bar{x}^e = 1.00$ and if $y = 2$, then $\bar{x}^e = 0.91$. If savings in the final period have a lower value, then it is more attractive to spend the grant. Therefore, indirect costs have

[25] For a municipality with a relatively short sample period, the assumption on the value of the savings in the final period is more important for determining its optimal decision.

[26] We only interpret the average value of x_i^e. Intuitively, we equal the marginal revenues and marginal costs for each municipality. However, the effectiveness of spending (β_t) is an average revenue over all municipalities. As a result, we underestimate revenues, and therefore indirect costs, for some municipalities, while we overestimate them for others. Therefore, we focus on the average indirect costs. Since the effectiveness of spending has to change over time to explain saving by municipalities, we cannot estimate the effectiveness of spending for individual municipalities (moreover, we have only 5 years).

Table 5: Estimated indirect costs of using 1 euro of the grant ($\bar{x}^e$) for different values of the savings in 2008 (y): standard result and robustness checks

y	standard result	if $r = 0.1$	if *length* = 2	if *length* = 6
0	1.00	1.00	0.50	1.50
0.25	0.95	0.96	0.46	1.46
0.5	0.93	0.95	0.45	1.41
0.75	0.91	0.93	0.46	1.39
1	0.90	0.92	0.45	1.38
1.25	0.90	0.92	0.45	1.36
1.5	0.91	0.91	0.45	1.35
1.75	0.91	0.92	0.45	1.35
2	0.91	0.92	0.45	1.36

to be higher to explain that a municipality spends the same amount. The distribution of x_i^e is similar for all levels of y.[27]

We conclude that the estimated indirect costs are larger than 0. Results do not depend too much on the value of y. For each euro of the grant that a municipality spends, it has to add on average about 90 cents from its own resources.[28]

Table 5 reports robustness checks as well. The second column of the table shows the estimated indirect costs when the discount rate is 0.1. For each level of y, $\bar{x}^e$ is a bit higher than in case of $r = 0.05$. If the discount rate increases, future gains become less important for a municipality. Thus, saving becomes less attractive and spending in the current period becomes more attractive. As a result, indirect costs have to be higher to explain why a municipality spends the same part of the grant.

The third column of Table 5 reports results in case a person leaves social assistance for only 2 years. In this case, we consider $\{0, 0.05, 0.1, ..., 2\}$ as possible values of x_i (41 different values). For all values of y, $\bar{x}^e$ roughly halves compared to the estimated value if *length* $= 4$. In case of $y = 0.5$, $\bar{x}^e$

[27] If we only consider municipalities that have one optimal path that minimizes the expression in Equation (6), then the estimated indirect costs are in general lower, but do not differ much. For example, in case of $y = 0.5$, $\bar{x}^e$ equals 0.87 (this value is the average over 293 municipalities).

[28] A back-of-the-envelope calculation shows that this estimate is in the same range as the part of the general unconditional block grant that the national government labels for the indirect costs of social assistance and welfare-to-work programs (1.5 billion euros in 2008, see Footnote 13). According to our estimation, in 2008, municipalities need in total about 1.4 billion euros to fully spend the grant of 1.6 billion euros ($= 0.9 \cdot 1.6$).

equals 0.45. Revenues from spending the grant halve if *length* $= 2$. Therefore, spending is less attractive and the estimated indirect costs have to be lower to explain why a municipality spends a similar amount. The fourth column of Table 5 shows results in case *length* $= 6$. Here, possible values of x_i are $\{0, 0.15, 0.3, ..., 6\}$ (41 values). The value of $\bar{x}^e$ increases by roughly 50% for all values of y. This finding makes sense as revenues of spending increase by 50%. Because spending the grant is more attractive, the indirect costs have to be higher to explain why a municipality spends the same part of the grant. Hence, $\bar{x}^e$ is quite sensitive to the value of the variable *length*. However, even if the value of *length* is only half of our best, data based, approximation, then the indirect costs are still substantial.

4.4 Robustness check

The method that we use in the previous section (implicitly) attaches a value to annual savings and borrowings. To check whether our results depend on this aspect of our method, we also estimate the indirect costs in a setting where additional savings and borrowings are not possible. In this static setting, we can derive an analytical expression for the indirect costs.

The total revenues of expenditures on welfare-to-work programs of a municipality are the same as before (see Equation (3)). The total costs of welfare-to-work programs of a municipality are now:

$$TC_{i,t} = x_{i,t} U_{i,t}$$

where the indirect costs of 1 euro of actual programs are municipality-specific and year-specific.

In each year, a municipality allocates the available amount of money. Per euro, it decides to spend the euro, save the euro, or give the euro back. The municipality uses the euro for the purpose that generates the highest marginal profit given the preliminary levels of $U_{i,t}$, $S_{i,t}$, and $T_{i,t}$ (that is, given the allocation of the euros on which it already decided in that year). As we argue in Section 4.3, saving a euro always gives a higher marginal profit than returning that euro. The marginal profit of saving a euro is equal to or larger than 0, while the marginal profit of returning a euro is 0. Therefore, until the municipality has saved the maximum allowed amount, it only considers to use or save the euro that it has to allocate. If it is not possible anymore to save ($S_{i,t} = 0.75 G_{i,t}$), then the municipality considers to use the euro or to give it back. This latter assessment is static as its outcome does not impact future decisions. The marginal profit of spending a euro is in this case:

$$\left(\frac{\partial TR_{i,t}}{\partial U_{i,t}} - \frac{\partial TC_{i,t}}{\partial U_{i,t}} \right) \Bigg| (S_{i,t} = 0.75G_{i,t}) = \frac{\mathit{benefit}_t \cdot \mathit{length} \cdot \mathit{pop}_{i,t} \cdot \beta_t}{U_{i,t} + \mathit{pop}_{i,t}} - x_{i,t} \qquad (7)$$

This marginal profit decreases if $U_{i,t}$ increases, while the marginal profit of returning money is independent of the level of $T_{i,t}$.

Hence, if we observe in the data that in a certain year a municipality saves the maximum allowed amount ($S_{i,t} = 0.75G_{i,t}$), spends money ($U_{i,t} > 0$), and returns money ($T_{i,t} > 0$), then we know that this municipality assessed spending and returning. Moreover, we know that at lower levels of $U_{i,t}$ the marginal profit of spending a euro is higher than the marginal profit of returning the euro, while at higher levels of $U_{i,t}$ the opposite is true (i.e., there is no corner solution).

Therefore, in this year, this municipality has chosen its expenditure level such that the marginal profit of spending (Equation (7)) equals the marginal profit of returning (0). Thus, at the $U_{i,t}$ we observe, it holds that:

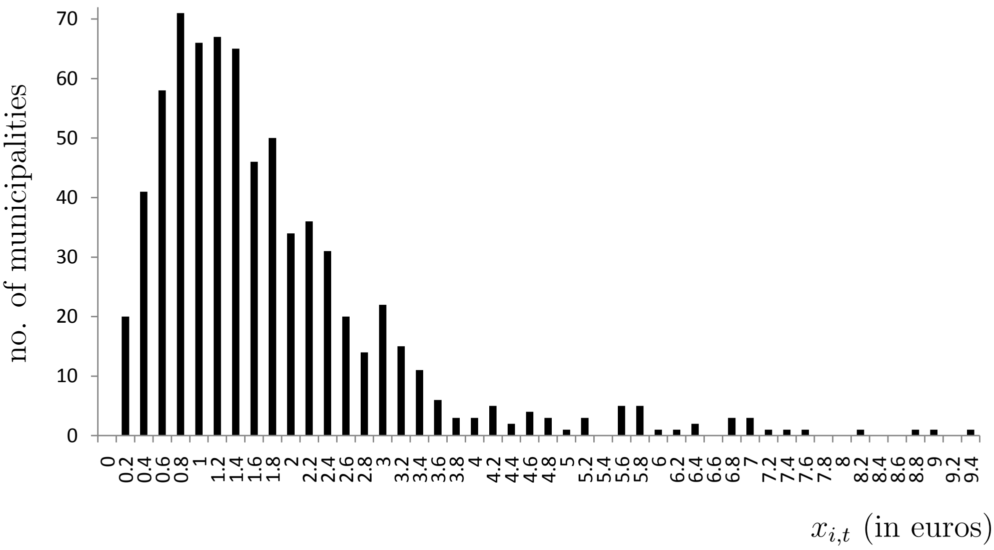
$$x_{i,t} = \frac{\mathit{benefit}_t \cdot \mathit{length} \cdot \mathit{pop}_{i,t} \cdot \beta_t}{U_{i,t} + \mathit{pop}_{i,t}}$$

Next to $U_{i,t}$, we also know all other variables at the right hand side of this expression. As a result, we can calculate $x_{i,t}$ for all municipalities i in year t with $S_{i,t} = 0.75G_{i,t}$, $U_{i,t} > 0$, and $T_{i,t} > 0$. In total, there are 727 of such observations for 297 different municipalities.

Figure 6 shows the result. Also this simple method shows that the estimated indirect costs are larger than 0. The average value of $x_{i,t}$ is 1.73. Thus, according to this method, it costs a municipality on average 1.73 euros to spend 1 euro of the grant. For most observations, the estimated value is lower than 6. If we exclude the 19 (48) estimated values that are larger than 6 (4), then the average value is 1.55 (1.41). The estimated indirect costs are higher than in the dynamic setting. This result makes sense since in the static setting we only estimate indirect costs of municipalities in years that they return money to the national government. Naturally, municipalities return money if they have high indirect costs. Given this issue, the level of the estimated indirect costs seems more or less comparable. Results from the previous section appear to be robust.[29]

[29] The estimated $x_{i,t}$ is robust to the existence of additional indirect fixed costs since these costs would not have an impact on the marginal profit of spending.

Figure 6: The estimated indirect costs of using 1 euro of the grant ($x_{i,t}$) in the static setting



Note: The figure does not contain the 3 highest values (10.34, 13.10, and 22.45).

5 Conclusion

Dutch municipalities receive a conditional block grant for welfare-to-work programs. Since municipalities pay for social assistance, spending this grant seems very attractive for them. However, many municipalities do not use a large part of their grant. This paper studies why this is the case. As such, it offers a different perspective on intergovernmental grants. Current papers focus on how recipients spend grants. We consider the option that recipients do not fully use their grant.

We emphasize that municipalities can only use the conditional block grant for expenditures of which they can prove that they were done for the purpose of the grant. Municipalities have to pay other, more indirect expenditures from their own resources. We argue that if the indirect costs of programs are sufficiently high, then it is not attractive for municipalities to fully spend the grant. Normally, the national government does not know these costs exactly. With the help of our model and municipality-specific data on grants and expenditure levels, we estimate the costs of using the grant. We find that municipalities have to add on average about 90 cents from their own resources to spend 1 euro of the grant. Naturally, policy makers should not take this number too literally as it depends on our model and the value of some parameters in this model (like the spell of work after leaving social assistance). Moreover, other possible explanations that we do not include in our model (like careful budgeting by municipalities and disappointing results of programs of which the price depended on job placements) can also impact this number. Our main message is that the indirect costs are larger than 0 and thus impact municipalities' behavior.

Next to the grant that we study, also many other conditional block grants involve some kind of indirect costs (see, e.g., the examples in the introduction). These costs have an impact on recipients' behavior and policy makers should take them into account when they design a grant. The method that we introduce in this paper could help researchers and policy makers to estimate the often hidden indirect costs. Moreover, also matching grants often have, next to the known explicit matching requirement, an implicit matching component (see Cashel-Cordo and Craig (1990)). Therefore, indirect costs may also explain why recipients do not use a matching grant as intensively as a donor wishes. An example of closed-ended matching grants of which policy makers worry whether recipients use them sufficiently are the European Structural and Cohesion Funds (Marzinotto (2011)). Recipients do not use billions of euros of these grants (see, e.g., Court of Auditors (2004, p. 53 and p. 59) and Court of Auditors (2005, p. 50)). Possibly, indirect costs are an important factor. Recently, for example, the European Commission recommended Italy to invest in administrative capacity in order to be able to receive more money from the Cohesion Fund (European Commission (2011*b*, p. 7), see also Milio (2007)). Also Verheijen (2007) mentions the administrative capacity in Central European and Baltic countries as a constraint for using the Structural Funds. Via our method, researchers and policy makers can estimate the real matching rate of these matching grants as well.

Finally, theory on intergovernmental grants suggests to use open-ended matching grants to internalize spillover benefits (Oates (1999)). Researchers have wondered why conditional block grants and closed-ended matching grants occur frequently in practice while there is no justification for them in standard economic theory (see, e.g., Oates (1999), Huber and Runkel (2006), and Smart and Bird (2009)). The conditional block grant that we study is de facto a closed-ended matching grant because it has an implicit matching component. Moreover, since many municipalities do not fully use their grant, they would set the same expenditure level if the grant would be open-ended (that is, if it would be an infinite conditional block grant). Therefore, on a closer examination, standard economic theory does help to understand the design of the grant that we study.

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Appendix A: Optimal level of the grant

From Proposition A1 below follows that $G = U_{ng}$ is the optimal level of the conditional block grant for the national government. The intuition behind this result is as follows. If $G = U_{ng}$, then the municipality chooses the expenditure level that the national government wants or a lower level. A lower grant can only give an incentive to decrease expenditures. A higher grant can give an incentive to increase expenditures, but only if the current level of the grant is the only binding restriction for the municipality. If the municipality does not fully use the grant if $G = U_{ng}$ (i.e., it spends less than the national government wants), then a higher grant does not have any effect because the level of the indirect costs obstructs higher expenditures.

Proposition A1. If $G \neq U_{ng}$, then the difference between the expenditure level that the municipality sets and U_{ng} is always larger than or equal to this difference in case of $G = U_{ng}$.

Proof. Suppose that $G = h = ((\alpha + w)/(1 + x)) - 1$, where w is a constant that determines how much h differs from U_{ng}. Define $\mathring{x}$ as the highest level of x at which the municipality uses this grant completely (this expression follows directly from Equation (1)):

$$\mathring{x} = \frac{\beta}{\alpha - \beta + w}$$

We divide the alternatives that the national government has for $h = U_{ng}$ (i.e., set $w = 0$) in 3 categories:

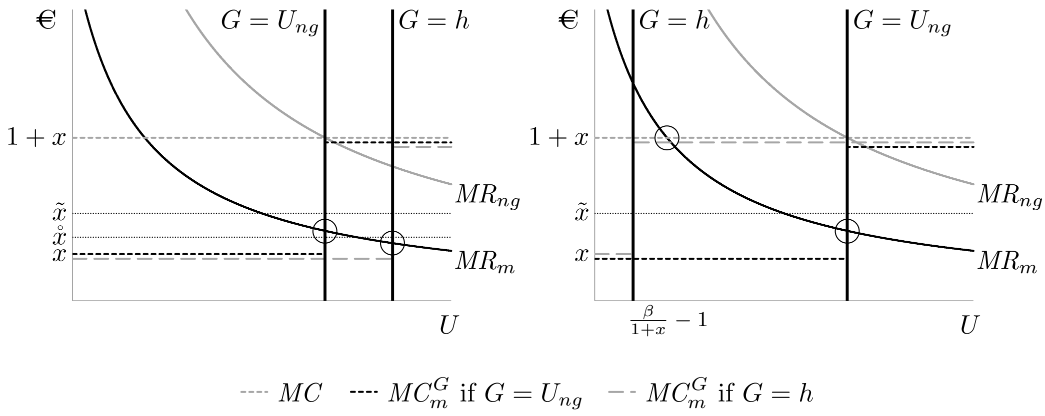
1. $h > U_{ng}$ (i.e., set $w > 0$). In this case, $\mathring{x} < \tilde{x}$. There exist two scenarios. First, we consider the scenario $x \leq \mathring{x}$. The municipality uses the whole grant: $U^* = h$ (see the left panel of Figure A1). The municipality never spends more than h since Equation (2) always holds. If $G = h$, then Equation (2) is equivalent to:

$$w \geq \beta - \alpha \tag{A1}$$

   where $0 > \beta - \alpha$. Since the grant is higher than what the municipality would spend if there would not be a grant, it is never attractive to spend more than the grant as from then the municipality has to bear the full marginal costs. If $G = U_{ng}$, then $U^* = U_{ng}$ (if $x \leq \mathring{x}$, then it is also true that $x \leq \tilde{x}$). Since $h > U_{ng}$, the chosen U differs more from U_{ng} if $G = h$ than if $G = U_{ng}$.

   Second, we consider the scenario $x > \mathring{x}$. The municipality chooses U such that $MR_m = MC_m^G$ and therefore $U^* = (\beta/x) - 1$. If $G = U_{ng}$ and $x \leq \tilde{x}$, then $U^* = U_{ng}$. Since $(\beta/x) - 1 \geq U_{ng}$ if $x \leq \tilde{x}$, the difference between the U that the municipality chooses and U_{ng} is larger than or equal to this difference if $G = h$. If $G = U_{ng}$ and $x > \tilde{x}$, then $U^* = (\beta/x) - 1$. Hence, in this case the chosen U is similar in case of $G = U_{ng}$ and $G = h$.

Figure A1: Examples of the municipality's decision if the grant differs from the expenditure level that the national government wishes ($G \neq U_{ng}$)



2. $U_{ng} > h > (\beta/(1+x)) - 1$ (i.e., set $0 > w > \beta - \alpha$). In this case, $\mathring{x} > \tilde{x}$. Again, there exist two scenarios. First, it can be that $x \leq \mathring{x}$. The municipality uses the full grant: $U^* = h$. The municipality never spends more than h (since Equation (A1) holds). If $G = U_{ng}$ and $x \leq \tilde{x}$, then $U^* = U_{ng}$. Hence, the chosen U differs more from U_{ng} if $G = h$. If $G = U_{ng}$ and $x > \tilde{x}$, then $U^* = (\beta/x) - 1 < U_{ng}$. Since $h \leq (\beta/x) - 1$ if $x \leq \mathring{x}$, the U that the municipality chooses differs at least as much from U_{ng} if $G = h$.

   The second scenario is $x > \mathring{x}$. In this scenario, the municipality does not fully use the grant, it sets $U^* = (\beta/x) - 1$. If $G = U_{ng}$, then $U^* = (\beta/x) - 1$ (if $x > \mathring{x}$, then it is also true that $x > \tilde{x}$). Thus, the municipality chooses the same U in both cases.

3. $(\beta/(1+x)) - 1 \geq h \geq 0$ (i.e., set $\beta - \alpha \geq w \geq (1+x) - \alpha$). In this case, $\mathring{x}$ is not defined. The municipality always chooses $U^* = (\beta/(1+x)) - 1$ (see the right panel of Figure A1). It chooses the same level as it would do if there would not be a grant. The grant is too low to have an impact on the decision of the municipality. If $G = U_{ng}$ and $x \leq \tilde{x}$, then $U^* = U_{ng}$. Since $(\beta/(1+x)) - 1 < U_{ng}$, the municipality chooses a U that differs more from U_{ng} than the U it chooses in case of $G = U_{ng}$ (the right panel of Figure A1 shows this outcome). If $G = U_{ng}$ and $x > \tilde{x}$, then $U^* = (\beta/x) - 1 < U_{ng}$. It follows that $(\beta/(1+x)) - 1 < (\beta/x) - 1$. □

Appendix B: Additional figures

Figure B1: Expenditures ($U_{i,t}$), savings (or borrowings) ($S_{i,t}$), and the amount returned ($T_{i,t}$) divided by the grant received ($G_{i,t}$) for each municipality in 2004

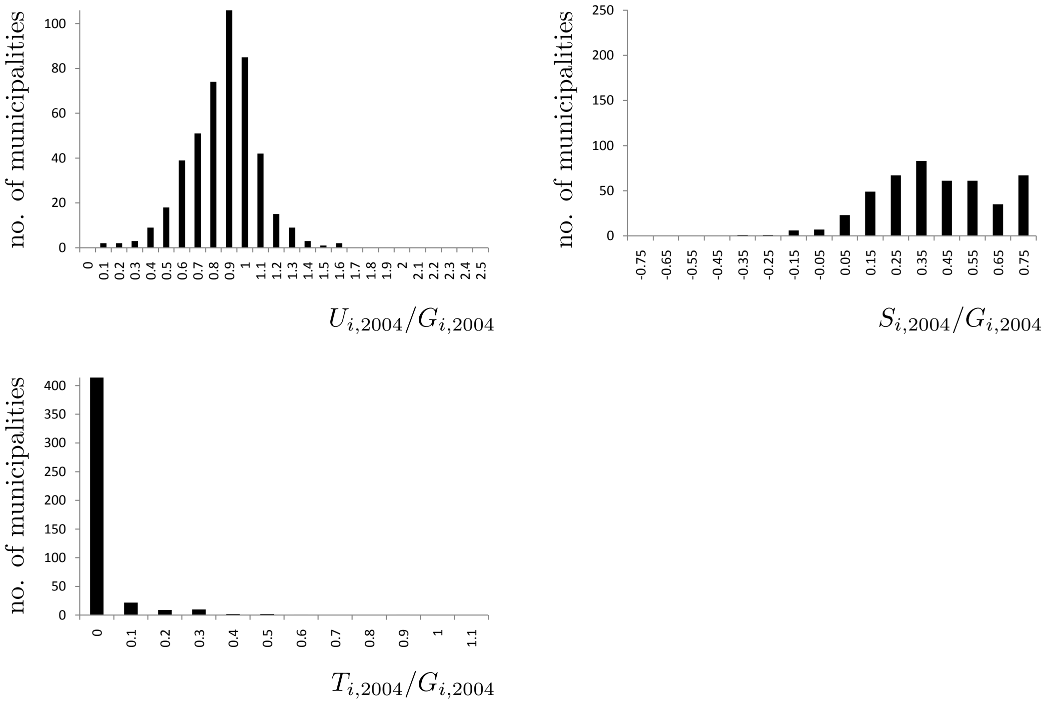


Figure B2: Expenditures ($U_{i,t}$), savings (or borrowings) ($S_{i,t}$), and the amount returned ($T_{i,t}$) divided by the grant received ($G_{i,t}$) for each municipality in 2005

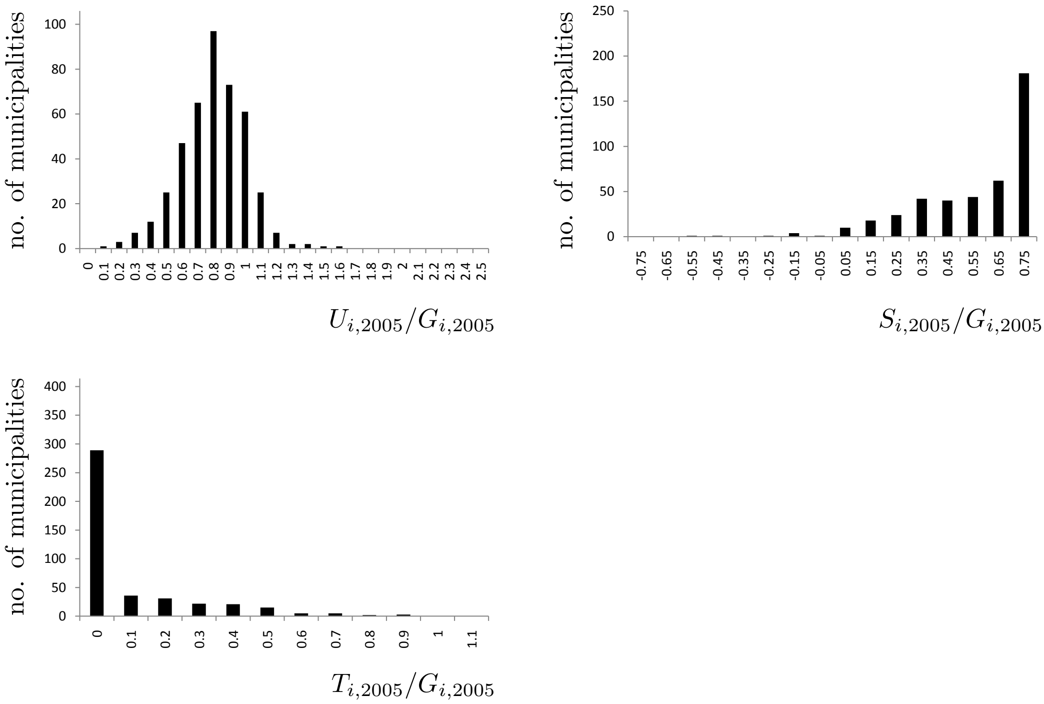


Figure B3: Expenditures ($U_{i,t}$), savings (or borrowings) ($S_{i,t}$), and the amount returned ($T_{i,t}$) divided by the grant received ($G_{i,t}$) for each municipality in 2007

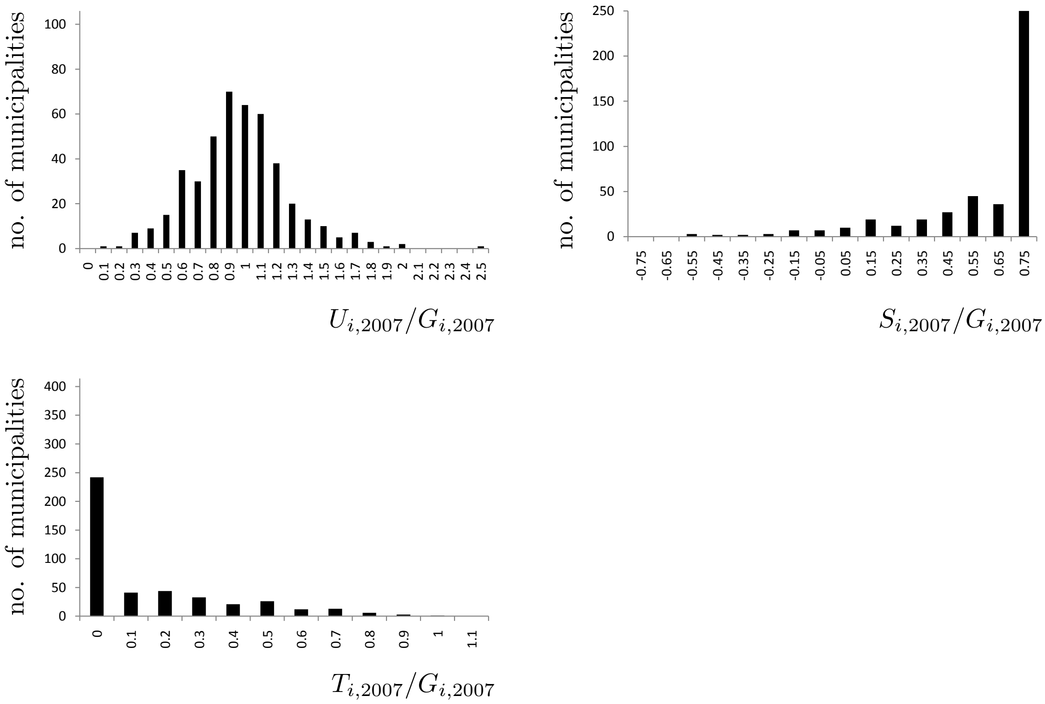


Figure B4: Expenditures ($U_{i,t}$), savings (or borrowings) ($S_{i,t}$), and the amount returned ($T_{i,t}$) divided by the grant received ($G_{i,t}$) for each municipality in 2008