



HAVE DUTCH MUNICIPALITIES BECOME MORE EFFICIENT IN MANAGING THE COSTS OF SOCIAL ASSISTANCE DEPENDENCY?*

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ABSTRACT. Many welfare reforms undertaken in Organization of Economic Cooperation and Development (OECD) countries are directed toward enhancing efficiency in the administration and implementation of social security. In this perspective, reforms in The Netherlands are an example of decentralization through budgeting financial means to municipalities. By using data envelopment analysis, we assess the effect of the introduction of the new Work and Social Assistance Act (WSA) in 2004 on cost efficiency. By applying a stochastic frontier analysis, we assess the impact of municipal policy strategies on cost inefficiency for the period 2005–2007. We find a clear positive effect of the WSA in 2004 on cost efficiency. Pursuing a strategy of activation raised efficiency significantly.

1. INTRODUCTION

Decentralization of national welfare policies to local government levels is one of the main movements shaping social welfare in the U.S. and in Europe (OECD, 1999, 2003; Van Berkel, 2006; Borghi and van Berkel, 2007a, 2007b; Eichhorst, Kaufmann, and Konle-Seidl, 2008; Habibov and Fan, 2010). According to Eichhorst et al. (2008), who refer to this shift as “tools of New Welfare Governance,” it comprises processes of territorial or functional decentralization, which are quite similar across countries. In their view promoting the success of social policies, their provision and delivery has to be considered jointly with the organization and management of this process.

Decentralization is often justified by a need to improve efficiency. It prevents agency problems between national and local governments and local governments are assumed to be better able to adapt policy measures to local needs, priorities and local partnerships (OECD, 1999; Nativel, Sunley, and Martin, 2002; OECD, 2003; Balaguer-Coll, Prior, and Tortosa-Ausina, 2010). Kelleher and Yackee (2004) add the presumption that local officials can address problems more effectively. This paper evaluates two central claims in the decentralization debate. One claim is the overall positive impact of decentralization on the cost efficiency of local governments in public service delivery. The second claim is that local governments can indeed address and influence local problems more effectively.

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The literature shows mixed results on the effects of decentralization as will be discussed in Section 2. To evaluate the two central claims in the decentralization debate, we use a unique dataset covering the period 2000–2007 during which major reforms in the administration of welfare and social benefits in The Netherlands took place. The introduction of the new Work and Social Assistance Act (WSA) in 2004 decentralizes full (financial) responsibility for activating and reintegrating the 340,000 social assistance clients they had in 2004. An important aspect of the WSA reforms is the change in funding of municipalities. Instead of claiming all social assistance expenses directly from the central government, from 2004 onward, local governments get a fixed budget to cover all social assistance expenses. This new governance model creates incentives for reducing the number of benefit receivers since money saved by municipalities, originally earmarked for benefits, can be used for financing other expenses for local public goods. Since 2004 municipalities also have more freedom in choosing measures for activating their beneficiaries (Tergeest and Grubb, 2006; Van Berkel, 2006; Van Geuns and Van Gent, 2007).

But there is another relevant aspect in this matter. The main conclusion in a substantial and growing body of evaluation literature on active labor market policy is that there are indeed positive effects of local labor market policy instruments, but also that the net effects are in fact quite small (Grogger, Karoly, and Klerman, 2002; Kluve et al., 2007; De Koning, 2007; Card, Kluve and Weber, 2010). Therefore, a second interesting question is if municipalities in a decentralized system are better able to prevent social assistance dependency and to promote outflow to the labor market.

The reform of the Dutch welfare system and the data set at hand give a unique possibility to gain insight in these two fundamental questions about the effects of decentralization. The first question will be addressed for the period 2001–2007, so that an adequate assessment can be given of the WSA-reform in 2004, using data envelopment analysis. The second question will be addressed for the shorter period 2005–2007, because only for this period more detailed information on municipal policy initiatives is available. We use stochastic frontier analysis to assess the impact of the policy initiatives on efficiency.

In Section 2 we describe the arguments in favor and against the expectations that decentralization lead to more efficiency. In Section 3 we go into the specifics of data envelopment analysis and stochastic frontier analysis (SFA) as appropriate methods to analyze the efficiency of decentralization. Section 4 discusses the data used and the research design applied in this paper. In Sections 5 and 6 the empirical results are presented and finally Section 7 concludes and discusses the policy implications.

2. (IN)EFFICIENCY OF DECENTRALIZATION

There are two main arguments why decentralization should lead to more efficiency. The first reason has its origin in a rational institutionalist way of thinking, which is the basis for the new public management or neoinstitutional economics (Hall and Taylor, 1996; Scott, 2001; Ter Bogt, 2008). Organizations are assumed to make rational choices between costs and revenues, are well informed and in pursuit of efficiency. Because of information asymmetry the national government cannot adequately control municipalities so local governments can relatively easily shift the costs of public service delivery to national governments. This dilemma could be overcome by reinforcing the financial incentives of municipalities for better implementation. In its turn, this should lead to more efficiency both at the local and at the national level. Furthermore, this could also stimulate policy innovation and policy learning, because it allows for several simultaneous experiments by local governments (Strumpf, 2002). The second reason has its origin in the contingency theory of organizations, which assumes that in becoming efficient, organizations should

adapt to different environments (Donaldson, 2001). It is argued that local governments should be better equipped to adapt policy programs to local needs and circumstances, which should make social policies more flexible and more effective (OECD, 1998, 2003; Kelleher and Yackee, 2004). In situations where local policy responsibility is accompanied by financial responsibility, there is a clear incentive to perform better. Eventually this would enhance the efficiency. While both theoretical approaches lead to more efficiency, the underlying mechanisms are different.

Theoretically, it is also possible to think of a scenario in which efficiency improvements do not take place. In the neoinstitutional organizational sociology, organizations do not pursue efficiency *per se*, simply because organizations do not always know what is effective, *i.e.*, what is working and what is not. This certainly is true for “weak technology” organizations such as schools and social welfare organizations. In absence of knowledge and information, such organizations accept practices that have legitimacy instead of an empirically proven efficiency. That does not mean that organizations act irrationally or do not formulate goals and specify ways to reach them but “. . . these beliefs are myths in the sense that they depend for their efficacy, for their reality, on the fact that they are widely shared, or are promulgated by individuals or groups that have been granted the right to determine such matters” (Scott and Meyer, 1993, p. 1). In this social-constructionist point of view organizations behave according to normative and cultural guidelines. The outcome of this behavior could be that organizations converge “. . . around short-term behavioral equilibria that may be less efficient than rejected alternatives” (DiMaggio, 1998, p. 697). Legitimacy instead of efficiency also plays a role in the political institutional point of view which introduces the concept of political conflict and path dependency. Here is organizational behavior the result of political conflict which often leads to compromises at the end. This could lead organizations to accept goals that differ from the national of efficiency one (see for instance: Bredgaard Dalsgaard, and Larsen, 2003). Furthermore, the fact that municipalities are democratically controlled organizations, with different political assemblies and priorities could lead to outcomes that are less efficient.

The empirical literature shows mixed results on the effects of decentralization. For instance, Rodriguez-Pose and Bwire (2004) found no effect when they relate changes in levels of regional autonomy to regional differences in economic growth patterns in regions in six European countries. Otsuka, Goto, and Sueyoshi (2010) found that the fiscal transfer of funds for regional public spending from the Japanese central government to local governments negatively affected their performance because the governmental funding reduced their motivation towards an efficient use of the taxpayer’s money in supplying public goods. Balaguer-Coll et al. (2010) found for Spain that for the municipal level there is not a clear-cut answer as to whether enhanced decentralization, or enhanced centralization, is “good” or “bad” in terms of cost efficiency. Their results suggest that some municipalities could manage their resources more efficiently if they were granted more power. Although these sort of decentralized economies do not emerge for all municipalities, their magnitude clearly overshadows the diseconomies found if downscaling of decision making goes too far and least decentralized municipalities dominate.

For the U.S., the introduction of the U.S. Personal Responsibility and Work Opportunities Reconciliation Act (PRWORA) in 1996 which rendered federal states more discretionary power, evoked a theoretical and empirical debate on whether the decline in social assistance dependency was caused by the unprecedented economic growth in the 1990s or by the effects of welfare reforms and decentralization. See Danielson and Klerman (2008), Wallace (2007), Klerman and Haider (2004), Blank (2002), and Bell (2001). Huffman and Kilkenny (2007) analyzed the regional variation of the new Temporary Assistance to Needy Families (TANF) program that each state has to develop under PRWORA. They find very little evidence that household behavior with respect to TANF

instruments varies across regions in the U.S. This finding may undermine the efficiency rationale for devolution of authority over welfare programs to the states. But they also find that similar instruments may lead to different outcomes across regions because demographic and initial conditions vary. Thus, to achieve similar outcomes across regions, region-specific policies may be warranted. This is also argued by Blien, Hirschenauer, and Hong Van (2010) for Germany. For Sweden, Lundin and Skedinger (2006) investigated the effects of decentralization of active labor market policies. Although they do not focus on separate policy measures, they conclude that decentralization has spurred local initiatives in the form of projects organized by municipalities and increased targeting on outsiders on the labor market.

Besides decentralization also coordination between and within governmental organizations might improve efficient decision making that is beneficial for successful policy outcomes in terms of economic performance of regions. However, the empirical literature with regard to the positive effect of coordination is scarce. Hammond and Tosun (2011) find for the U.S. that the fragmentation of general-purpose governments per capita has a negative impact on employment and population growth in nonmetropolitan counties. Their results suggest that local government decentralization matters differently for metropolitan and nonmetropolitan counties. A study by Grassmueck and Shields (2010) for the U.S. shows the opposite: regions with fragmented governmental structures perform better. They do not suggest that fragmented regional government units are more efficient in producing and providing public goods, but argue that households and firms may be willing to forego additional efficiency for more localized control over public policies.

This paper evaluates two central claims in the decentralization debate. First, what have been the effects of decentralization on the municipal cost efficiency of social assistance benefits? It adds to the literature of assessing the impact of public management reform, especially at the local levels of government and public service delivery (Ridder, Bruns, and Spier, 2005; Ter Bogt, 2008). Second, what is the influence of local policy strategies on this efficiency? It contributes to the literature of assessing the impact of instruments of active labor market policy (Kluve et al., 2007; Card et al., 2010).

3. FRONTIER ANALYSIS

Performances of firms or institutions are usually analyzed in terms of productive or cost efficiency. Efficiency is determined by the proximity of the actual production or costs of the firm or institution to the production or cost frontier. The absence of efficiency necessarily leads to a departure from production maximization or cost minimization and therefore creates inefficiency. In this paper, we focus on municipal cost efficiency with respect to their social assistance payments. The size of this cost inefficiency is based on the difference between observed costs and predicted minimum costs given scale, a mix of relevant outputs and factor prices as explanatory variables. In other words, each municipality in the sample is benchmarked against the "best" municipality in the sample.

In the literature, frontiers have been estimated in the past using many different methods. Coelli (1996a, 1996b) clearly explains the pros and cons of the various methods such as Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) that we will use in our empirical analysis. The nonparametric approach to measuring efficiency, DEA, has the advantage of imposing less structure on the frontier than the parametric approach SFA. On the other hand, a drawback of the nonparametric DEA approach is the deterministic nature, i.e., not allowing for random errors caused by chance, data problems or other measurement errors.

In this paper, we first apply DEA to explore the changes in efficiency of municipal costs of social assistance caused by the introduction of the WSA in the Netherlands in 2004

by using data over the period 2001–2007. In the case of municipalities' social assistance expenses, this means that the efficient municipality is not able to cut more on social assistance costs, given its demographic and socioeconomic characteristics.

Next, we would like to assess the impact of municipal policy strategies on the efficiency of social assistance costs. Information about the policy strategies is only available for the shorter period 2005–2007 and can thus not be analyzed for the total period 2001–2007. DEA is a deterministic and nonparametric technique that does not allow the inclusion of policy strategies that can be related to inefficiencies. Therefore we apply SFA which is basically a parametric regression model with random errors. In a SFA these errors comprise (i) inefficiencies, following an asymmetric distribution, usually a truncated or half-normal distribution, and (ii) random errors following a symmetric distribution, usually a standard normal distribution. The reason for this particular structure of the composite error term is that inefficiencies are part of the error process and by definition cannot be negative. In order to link efficiency to municipal policy strategies, we use a single-step estimation procedure, where both SFA and strategy effects on efficiency are addressed simultaneously. This implies that policy strategies are exogenous in the model. More details on SFA are in the Appendix.

4. DATA

For the empirical analysis we have used data for all 443 municipalities in the Netherlands over the period of 2001–2007.¹ Most data we use are drawn from Statistics Netherlands. The exact sources and definitions of the variables are documented in the Appendix. The data on expenditures on social assistance are from the Netherlands Ministry of Social Affairs.²

In the frontier analysis the actual absolute municipal social assistance expenditures to pay benefits is the dependent (or output) variable.³ The inputs are identified as the variables that are used by the central government to determine the budgeted expenditures on social assistance for each municipality based on objective variables not at the municipal's discretion.⁴ The basic idea is that these objective variables determine to a large extent the inevitable burden of social assistance. These variables are, e.g., the number of

¹Over time the number of municipalities has decreased due to mergers of small municipalities. To solve this problem, municipalities were regrouped into the 443 municipalities of 2007.

²For the period of 2004–2007 all expenditures are available at municipal level. For 2001–2003 municipalities working together in a joint social service with others (i.e., an Inter-Municipal Social Service, IMS) only information is available at that IMS-level. In those cases we have redistributed the information at municipal levels based on each municipal share of households in the total of the IMS.

³After 2004, municipal social assistance budgets comprise two parts: (i) an income part providing income support for the social assistance recipient and (ii) a work part providing (re-)integration (i.e., activation) support in order to stimulate acquiring skills and/or job search in order to increase the chance to (re-)enter the labor market. Before 2004 this distinction was not made and there was only one budget, corresponding to the income part. The dependent variable in our analysis refers only to the expenditures of the income part, because only for this part the municipality bears the financial risk. This is not the case with the work part. Municipalities are stimulated to spend this money, because otherwise the money has to be paid back to the central government.

⁴This so-called objective distribution-model ("objectief verdeelmodel") is gradually implemented and first been applied to the municipalities with over 60,000 inhabitants: in 2004 the total amount of budget that was objectively divided lies at 40 percent, in 2006 the full budget was objectively divided. For the smaller municipalities (in 2004: less than 40,000 inhabitants and from 2006 less than 30,000 inhabitants) the budgets were based on a so-called historical division model ("historisch verdeelmodel"). For the in between group (40,000–60,000 inhabitants) a mixture is chosen between an objective and a historical dividing model.

TABLE 1: Four Municipal Policy Strategies with Respect to Social Assistance, 2005–2007

Municipal Strategy	Short Description	Indicators
Control (C1)	Threat; emphasis on fraud detection and research whether recipients are not eligible for other social arrangements	Wajong-inflow* WSW inflow** Fraud cases
Activate (A)	Emphasis on participation by entering into subsidized jobs or other courses	Subsidized employment Non-subsidized courses
Employment (E)	Emphasis on job creation by stimulus of new firms or by high municipal economic affairs outlays	Growth rate of establishments Expenditures on economic affairs
Coordination (C2)	Municipalities that have a joint social service with other municipalities***	

Notes: *Wajong refers to the disability arrangement for young persons with no employment history.

**WSW refers to employment through social work provisions for disabled persons.

***IMS stands for Inter-Municipal Social service and is a dummy variable of 1 when a municipality joins such an IMS.

single-parent households, the share of non-Western minorities and regional job growth. The budgets are in fact very close to the actual expenditures and hence expenditures are closely related to these “objective” factors that determine the budgets as well.

As mentioned in the previous section Data Envelopment Analysis (DEA is used to gain insight in the development of overall efficiency over the whole period 2001–2007 and allows us to detect if the efficiency improved after the introduction of the WSA in 2004. As a next step, we apply SFA as the appropriate method to find out if changes in efficiency are related to the use of particular policy strategies by municipalities to limit social assistance dependency (Edzes, 2010; Broersma, Edzes, and van Dijk, 2011). Information on the policy strategies is available only for the period 2005–2007. We will now elaborate on this issue. Each of these strategies can be identified by a number of indicators. Table 1 shows which indicators are used to reflect each strategy (Edzes, 2010).

A straightforward indicator for the *control strategy* is the share of detected fraud cases. We assume that the detected fraud case is a valid and reliable indicator for actual efforts from municipalities to combat fraud behavior. An analysis of differences between municipalities shows that substantial differences between municipalities in detected fraud cases occur when we look at region, scale and urbanization suggesting different efforts from municipalities (Edzes, 2010). The control strategy might also check whether social assistance benefit recipients are eligible for other social security arrangements that are not paid from the budget of the municipality. A successful strategy will raise the influx in such measures as disability for those without work experience (Wajong) or as social work provision (WSW) and therefore the influx in these type of social benefits will be above average in that municipality.

An *activation strategy* comprises subsidized employment, where social assistance benefit recipients obtain a sheltered job for which the wage costs are covered by a subsidy⁵ instead of from the income part of social assistance budget. Activation may also take the form of providing courses that enhance the skills for a job or job search, such as

⁵This subsidy stems from the work part of the municipal social assistance budgets.

TABLE 2: Options of Policy Strategies and Combinations

No.	Strategies	Municipalities in 2005–2007	No.	Strategies	Municipalities in 2005–2007
1	None	711	10	A + C2	38
2	Control (C1)	69	11	E + C2	17
3	Activate (A)	119	12	C1 + A + E	7
4	Employment (E)	69	13	C1 + A + C2	9
5	Coordination (C2)	201	14	C1 + E + C2	2
6	C1 + A	28	15	A + E + C2	5
7	C1 + E	22	16	C1 + A + E + C2	0
8	C1 + C2	16	17	All 2 combinations	137
9	A + E	19	18	All 3 combinations	23

application courses. Municipalities are free in the design as well as the number of courses they provide. Although the budget municipalities receive for activation strategies is fixed and determined by the number of recipients of social assistance corrected by the local labor market situation, municipalities differ substantially in the number and type of courses provided as well as the share of the activation budget they spend on courses (Edzes, 2010).

The *employment strategy* is reflected by the growth rate of the number of establishments, indicating successful municipal efforts to create favorable business conditions, and by the municipal expenses on economic affairs. Finally, the *coordination strategy* is reflected by the extent to which municipal social services, who carry out social assistance, work together in so-called Inter Municipality Services (IMS).

As a next step we determine for each municipality whether it lies above or below the national average of each of the indicators.⁶ If a municipality has a score above the national average on one indicator, reflecting a particular strategy, a dummy for such a municipality will be labeled 1, indicating it as user of this strategy. Based on the number of strategies a municipality uses, it will be allocated to one of the 16 single or multiple policy strategy categories in Table 2. Note that the 16 categories are mutually exclusive, i.e., each municipality enters in one and only one strategy option.

Table 2 shows the distribution over the 16 policy categories. The number of strategies by municipalities, for the period 2005–2008, adds up to a total of 1,329, i.e., for each of the three years, all 443 municipalities are covered. Note that most municipalities have no focus on any of the strategies, i.e., their value on each indicator for the policy strategies is below average and this leads to the classification that 711 municipalities between 2005 and 2008 are in the strategy category “None.” Note also that only a few municipalities focus on three strategies simultaneously, while there is no municipality focusing on all four options. Since particularly the option of using three strategies is not very popular among municipalities, we have also estimated the model with a variable indicating the number of strategies used (none, one, two, or three) irrespective of the type of strategy.

⁶Of course this implies that each indicator is scaled to make it comparable across municipalities. Wajong inflow and WSW inflow are scaled with the total municipal population between 15 and 64 years of age. Fraud cases are related to social assistance recipients. Subsidized employment and other, non-subsidized, activation courses are also scaled with the social assistance recipients. Annual growth of establishment is in percentages and Economic Affairs outlays are relative to the entire population. IMS is already a dummy variable.

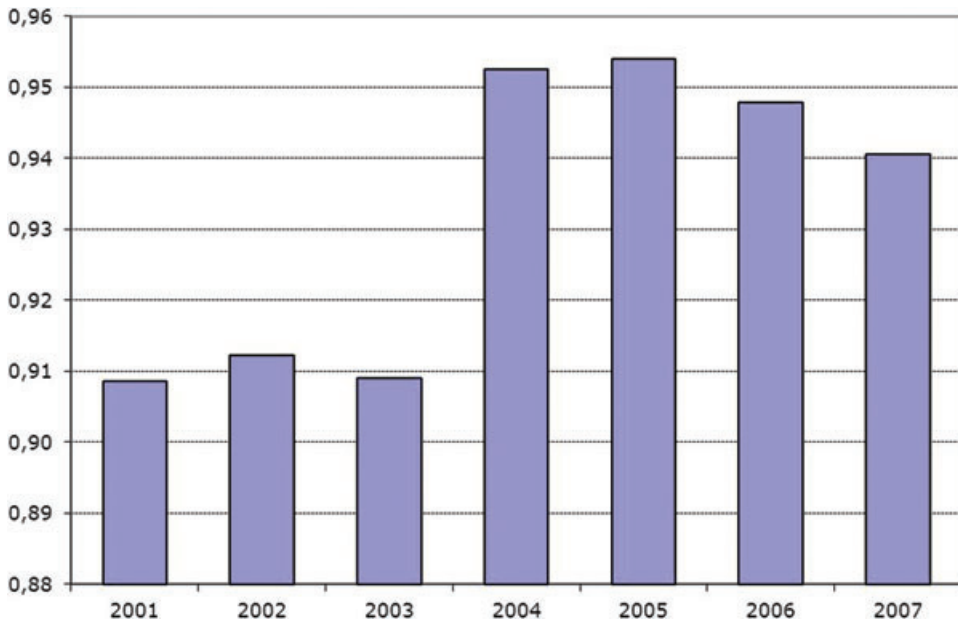


FIGURE 1: Average Municipal Efficiency of Social Assistance Expenses in The Netherlands, 2001–2007 (DEA).

5. EMPIRICAL RESULTS

In this section the empirical results are presented with regard to the efficiency measures obtained by applying the DEA and SFA approach. First we applied DEA using the computer program of Coelli (1996a). DEA is a deterministic and nonparametric analytical approach in which linear programming determines the efficiency. The output variable comprises the municipal social assistance expenditures, which will be related to eight inputs, viz. the demographic and socioeconomic variables that determine the municipal social assistance budget: (i) household with a low income, (ii) single-parent households, (iii) non-Western minorities, (iv) inhabitants with an unemployment insurance benefit, (v) inhabitants with a low education, (vi) vacancy–unemployment ratio of the COROP-region (NUTS-3 region) in which the municipality is located, (vii) number of municipal jobs, and (viii) address density, as urbanization measure.

Figure 1 gives the average annual efficiency of municipal social assistance expenses between 2001 and 2007, based on the above DEA model.⁷ First of all we can conclude that the overall level of efficiency is high (above 90 percent) in all years. Clearly the pattern of the efficiency over time shows a break in 2004. We conducted a sensitivity analysis by varying the inputs. Apart from minor changes in the average efficiency level, the pattern over time, including the clear break in 2004, remained the same. This provides evidence in favor of the premise that introduction of the decentralization of the WSA to municipalities has raised efficiency. Efficiency rose from 91 percent in the period 2001–2003 to 95 percent in the period 2004–2007, a 4 percent points increase between 2003 and 2004. Note the downward trend in efficiency after 2005. The explanation for his negative trend will be discussed in the sequel.

⁷We apply the Malmqvist index to account for the possible changes in the frontier itself as a result of the reform.

The next step is that we relate the variation in efficiency among municipalities to the policy strategies they use in an SFA model. Because data for the policy strategies are not available for all years, this analysis is only possible for the period 2005–2007. The cost frontier model comprises a cost model, relating municipal social assistance costs (SAC) to a number of explanatory variables and an inefficiency model relating inefficiency (u) to municipal strategy variables ($D_{\text{policy-strat}}$). The SFA model is specified as

$$\begin{aligned} \log(\text{SAC}_{i,t}) = & \beta_{0,t} + \beta_1 \log(\text{HH}_{\text{low-inc},i,t}) + \beta_2 \log(\text{HH}_{\text{single-par},i,t}) \\ & + \beta_3 \log(\text{POP}_{\text{minor},i,t}) + \beta_4 \log(\text{POP}_{\text{unem-insur},i,t}) + \beta_5 \log(\text{POP}_{\text{low-edu},i,t}) \\ & + \beta_6 \log(V/U)_{i,t} + \beta_7 \log(A/S)_{i,t} + \beta_8 \log(\text{Jobs}_{\text{empl},i,t}) \\ (1) \quad & + \sum_{i=9}^{19} \beta_i D_{\text{region},i-8} + \sum_{i=20}^{23} \beta_i D_{\text{size},i-10} + v_{i,t} + u_{i,t} \end{aligned}$$

and

$$(2) \quad u_{i,t} = \delta_0 + \sum_{j=1}^N \delta_j D_{\text{policy-strat},j,t} + \varepsilon_{i,t},$$

where $\text{SAC}_{i,t}$ are the social assistance expenses of municipality i in period t . The β_0 represents period fixed effects, the other β 's are parameters.⁸ HH variables represent the number of households with specific characteristics (low income or single parent), POP refers to the number of inhabitants with certain characteristics (non-Western minority, having an unemployment insurance benefit or low education). V/U is the vacancy–unemployment ratio of the COROP-region (NUTS3-level) in which the municipality is located and acts as an approximation of municipal labor market tightness, A/S is the number of addresses (A) per km² municipal surface (S), which acts as measure of urbanization. Jobs represents the number of jobs located within a municipality and finally the D variables refer to dummy variables reflecting municipal characteristics, viz. the part of the country NUTS1-region where the municipality is located and the size class it belongs to.⁹ Finally, the error terms in Equation (1) comprises $v_{i,t} + u_{i,t}$. The $v_{i,t}$'s are iid random variables following a $N(0, \sigma_v^2)$ distribution and the $u_{i,t} > 0$ are iid distributed $N(\mu_{i,t}, \sigma_u^2)$. The $u_{i,t}$'s represent the inefficiency parameter, related to the municipal policy strategies $D_{\text{policy-strat},j,t}$ described in Table 2.¹⁰

⁸The model specification in Equation (1) represents the variables of the simplified model. We adopt a modeling strategy of moving from general to specific. The general model contains additional variables that could validly be deleted from our model. The estimation results of this general model are available upon request. Cross-section (i.e., municipal) fixed effects were not considered because then we lose too many degrees of freedom. Instead we include some characteristics of the municipalities like the part of the country (Nuts 1 region) where it is located and the size class of the municipality.

⁹Four size classes are distinguished: (i) more than 100,000 inhabitants, (ii) 50,000–100,000 inhabitants, (iii) 20,000–50,000 inhabitants, and (iv) less than 20,000 inhabitants.

¹⁰We do acknowledge the fact that endogeneity between municipal policy strategies and social assistance expenses are important. However, we feel this is less of an issue here for number of reasons. First, in essence a municipality is free to determine what policy strategy it wishes to follow. Of course this may be influenced by the local circumstances or the budgets they receive and these may be determined by local circumstances. Nevertheless, it remains at the municipality council's discretion what policy strategies it will use and the political preferences may differ for municipalities with comparable local labor markets. Second, the statistical method used, in this case the SFA, is already a two-step approach where first the total variation in social assistance expenditures is explained by conditional and exogenous factors. On top of that, the remaining variance is explained by introducing the policy strategies. Third, the strategies are measured not by using the actual share of the underlying indicators, but by determination of whether a municipality lies above or below the national average of each of these indicators.

The estimation results of the SFA model are reported in Table 3. The first model includes all possible options and combinations of policy strategies and also includes period fixed effects.¹¹ The results for model (1) in the first column of Table 3 show that period fixed effects are not significantly different from zero, so they can validly be omitted from the model of column 1, which gives the results represented in the second column. In the models of columns 3 and 4, we experiment with grouping municipalities that combine two or three policy strategies, because some combinations of specific policy strategies are only used by a very limited number of municipalities.

For these four model specifications, we find that all explanatory variables in the cost model part of Equation (1) are highly significant and have the expected sign. The variables in the cost model explain a lot of the variation in social assistance costs. A simple OLS regression of these variables without the policy variables shows an R^2 of 0.96.

Next we turn to the results of the inefficiency part of the model in the lower panel of Table 3. Please note that a negative coefficient implies that the particular policy measure improved the efficiency, whereas a positive coefficient points toward lower efficiency. The results for the model of the second column of Table 3 show that most policy variables are not significant and that some of the variables that are significant show an unexpected sign. An improvement in efficiency is exerted by a policy strategy of activating social assistance recipients. The control strategy and some combinations of control and job creation have a worsening effect on efficiency, and this also occurs for a focus on the combination of the three strategies of control, activation and coordination. When we group all municipalities that employ two or three strategies in the model of the third column, the combination of two strategies still lowers efficiency. The estimation results in the fourth column show that when all municipalities that employ more than one strategy are taken together in one variable, the result still is that a focus on multiple strategies lowers efficiency.¹²

Figure 2 shows the average municipal efficiency score for the years 2005–2007, based on the SFA estimations in the final column of Table 3. The efficiency pattern we found with the SFA model is very similar to the efficiency pattern we found with DEA approach for the same period 2005–2007, i.e., a downward trend after 2004 and a high overall efficiency of roughly 95 percent.

6. DEVELOPMENTS IN COST EFFICIENCY

Based on the finally selected model in the fourth column of Table 3, the result of Table 4 provide additional information on the mean level and the variation over municipalities of the various policy strategies we have distinguished.

¹¹Including municipal fixed effect dummies would boil down to adding 443 dummy variables to the model which implies a degrees of freedom problem. Instead we have added regional dummies and municipality size class dummies to pick up possible municipality fixed effects.

¹²Our model specification is drawn from Battese and Coelli (1995). In general terms, this may be expressed as $y_{i,t} = x_{i,t}\beta + (v_{i,t} + u_{i,t})$, where $y_{i,t}$ is the production of the i th municipality in year t , $x_{i,t}$ represents the vector of input quantities of municipality i and β is vector of unknown parameters. The $v_{i,t}$'s are random variables, that are iid, following a $N(0, \sigma_v^2)$ distribution and they are independent of $u_{i,t}$, which are nonnegative random variables, which are assumed to account for technical inefficiency in production and are assumed to be independently estimated as truncations at zero of the $N(m_{i,t}, \sigma_u^2)$, where $m_{i,t} = z_{i,t}\delta$, where $z_{i,t}$ is a vector of variables that affects the efficiency of the municipal strategies and δ is a vector of parameters. The parameterization of Battese and Corra (1977) is used to replace σ_v^2 and σ_u^2 by $\sigma^2 = \sigma_u^2 + \sigma_v^2$ and $\gamma = \sigma_u^2 / (\sigma_u^2 + \sigma_v^2)$. The estimated values of σ^2 and γ are also reported in Table 3. The significance of any form of a stochastic frontier can be tested by the significance of the parameter γ . If the null hypothesis that γ equals zero cannot be rejected, this would indicate that $\sigma_u^2 = 0$ and so $u_{i,t}$ can be removed from the model, which indicates that the model can then be estimated with simple OLS.

TABLE 3: Estimation Results of Social Assistance Cost Frontier Model, 2005–2007

	(1)	(2)	(3)	(4)
<i>Cost model</i>				
Including period fixed effects	Yes	No	No	No
Constant	9.019***	9.099***	9.138***	9.135***
Ln (HH_low income)	0.713***	0.721***	0.723***	0.723***
Ln (HH_single parent)	0.590***	0.607***	0.605***	0.605***
Ln (POP_minority)	0.154***	0.152***	0.152***	0.153***
Ln (POP_unempl. insurance)	0.189***	0.174***	0.173***	0.172***
Ln (POP_low edu.)	-0.120***	-0.123***	-0.128***	-0.127***
Ln (vacancy/unemployment)	-0.192***	-0.170***	-0.172***	-0.171***
Ln (jobs)	-0.223***	-0.227***	-0.223***	-0.223***
Ln (addresses/km ²)	0.110***	0.109***	0.109***	0.108***
North	0.177***	0.187***	0.185***	0.187***
West	0.163***	-0.168***	-0.175***	-0.175***
Size > 100k	-0.376***	-0.382***	-0.370***	-0.370***
Size 50–100k	-0.190***	-0.191***	-0.181***	-0.184***
Size 20–50k	-0.211***	-0.211***	-0.207***	-0.207***
Fixed effects: dummy 2006	0.029			
Dummy 2007	0.035			
<i>Inefficiency model</i>				
No specific strategy	0.010	0.001	0.021	0.022
C1	0.104*	0.110**	0.094*	0.094*
A	-0.212*	-0.274***	-0.298***	-0.316***
E	-0.072	0.022	-0.038	-0.029
C2	0.032	0.029	0.028	0.026
C1 + A	0.110	0.122*		
C1 + E	0.169**	0.180**		
C1 + C2	0.093	0.113		
A + E	0.037	0.050		
A + C2	-0.067	0.018		
E + C2	-0.258	-0.089		
C1 + A + E	0.117	0.133		
C1 + A + C2	0.219**	0.238**		
C1 + E + C2	0.146	0.174		
A + E + C2	0.109	0.120		
All combinations of 2 strategies			0.153**	
All combinations of 3 strategies			0.060	
All possible combinations				0.073*
σ^2	0.057**	0.056***	0.057***	0.057***
γ	0.028	0.020***	0.020***	0.023***
Log-likelihood	294.7	551.1	44.44	42.53
Number of observations	1329	1329	1329	1329
Number of cross sections	443	443	443	443
Number of time periods	3	3	3	3

Notes: Seven large outlying values have been removed from the sample. *Significance at 10 percent. **Significance at 5 percent. ***Significance at 1 percent.

It is clear that only strategies of activation (A) and employment (E) show a higher average mean efficiency than the baseline strategy, i.e., without focus on a particular strategy, while the control and coordination strategy and combinations of strategies lead to lower efficiency levels.

A possible explanation for the negative effect of control as strategy might be that 2005–2007 was a period of strong job growth following the 2002–2003 recession. In these

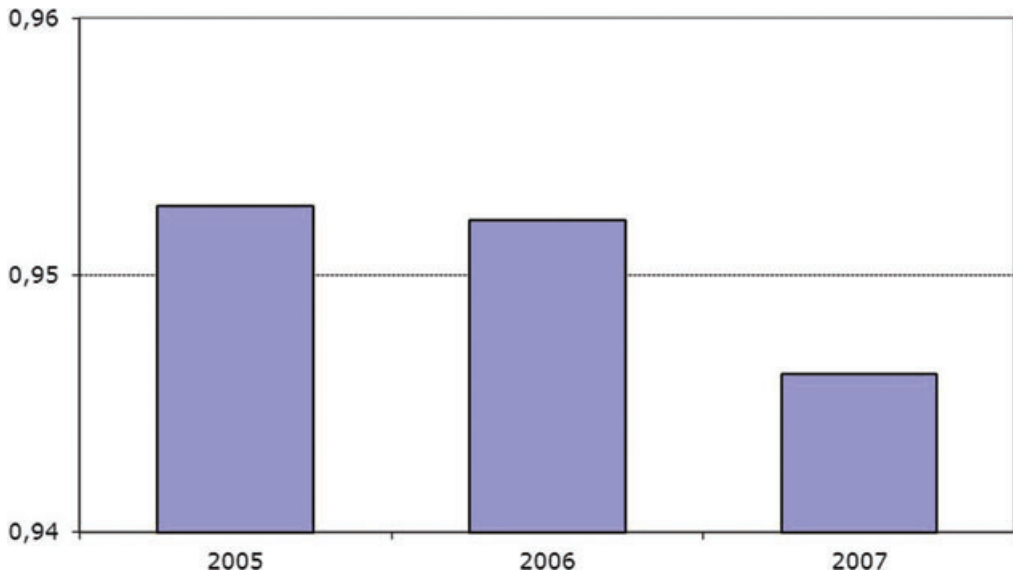


FIGURE 2: Average Municipal Efficiency of Social Assistance Expenses in The Netherlands, 2005–2007 (SFA).

TABLE 4: Efficiency Scores by Type of Policy Strategy, 2005–2007

Strategy	Mean	S.D.	Max – Min	Strategy	Mean	S.D.	Max – Min
None	0.963	0.003	0.970 – 0.956	A + C2	0.915	0.005	0.924 – 0.903
Control (C1)	0.877	0.005	0.896 – 0.869	E + C2	0.916	0.006	0.925 – 0.902
Activate (A)	0.997	0.002	1.000 – 0.996	C1 + A + E	0.811	0.005	0.815 – 0.803
Employment (E)	0.978	0.001	0.981 – 0.976	C1 + A + C2	0.808	0.004	0.815 – 0.803
Coordination (C2)	0.944	0.004	0.957 – 0.930	C1 + E + C2	0.810	0.007	0.815 – 0.805
C1 + A	0.913	0.004	0.921 – 0.904	A + E + C2	0.811	0.005	0.817 – 0.804
C1 + E	0.912	0.004	0.918 – 0.905	All 2 combinations	0.914	0.005	0.925 – 0.902
C1 + C2	0.913	0.004	0.919 – 0.906	All 3 combinations	0.810	0.005	0.817 – 0.803
A + E	0.915	0.004	0.923 – 0.907	All combinations	0.899	0.037	0.925 – 0.803

Note: S.D. stands for standard deviation, as a measure of spread of efficiency, the range provides the maximum and minimum efficiencies, i.e., municipalities with highest and lowest efficiency value.

circumstances with a lot of open vacancies, many social assistance recipients move relatively easily into employment. Control is now likely not as effective as in less favorable periods when recipients put less effort in job search with the argument that no jobs are available.

A plausible reason for the strong positive impact of activation as policy strategy is the fact that the employment inflow of social assistance recipients in regular jobs is more successful in this period of many job openings. In addition to that, activation might be successful because it is strongly linked to subsidized employment programs. For municipalities it is profitable if the activation strategy causes that a person no longer receives a social assistance benefit from the income part of the budget, but instead gets a sheltered job of which the wage is paid from the work-part of the budget. So, from the perspective of social assistance expenditures, an outflow into regular or subsidized jobs increases efficiency. From the perspective of overall active labor market costs at the national level,

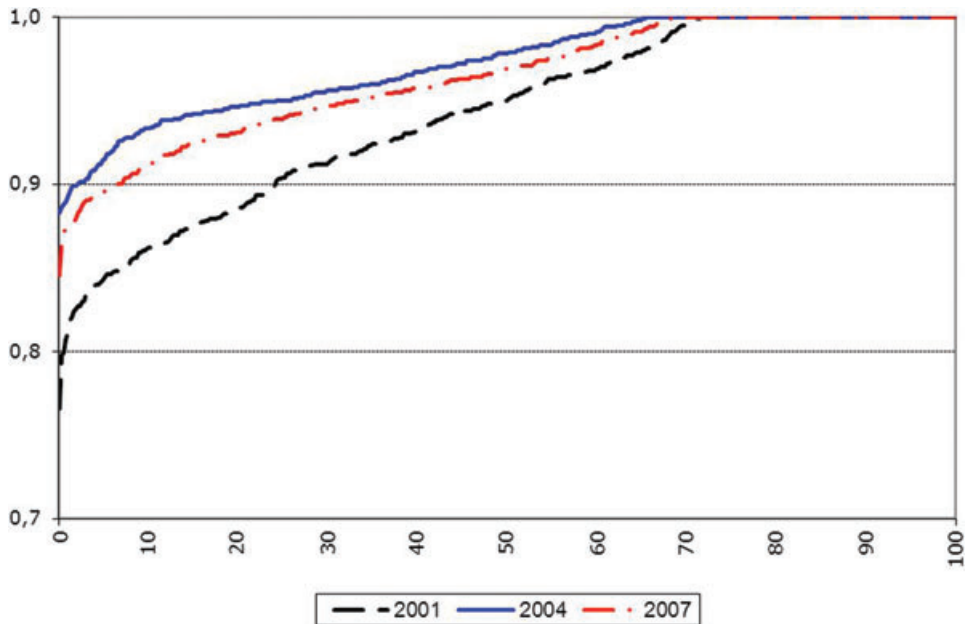


FIGURE 3: Distributions of Municipal Efficiency (Y-axis) for 2001, 2004, and 2007 from DEA (X-axis: Percent of Municipalities).

the costs of subsidized employment are a mere substitute of social assistance costs. Only when subsidized employment is temporary and helps to get a regular job after some time, it contributes to the efficiency of social assistance expenditures.

Our results do not imply that for any further increase in efficiency, municipalities should pursue a strategy of activation. In the period 2005–2007, this might have raised cost efficiency, but in other periods other strategies, or combinations thereof, might be more useful. The downward trend in efficiency for 2005–2007 in Figure 1 and 2 may be due to changes in the economic situation. Immediately after the 2002–2003 recession, it is relatively easy to activate the best skilled benefit recipients. After a few years, it will be harder to activate those with lesser skill levels to employment. This causes the slight downward trend in efficiency for the period 2005–2007.

As a final step in the interpretation of the results we will analyze the distribution of the efficiency scores over the municipalities in more detail. Figure 3 compares the efficiency scores based on the DEA approach for 2001, 2004, and 2007. This figure shows that the share of municipalities operating on the cost frontier (efficiency score = 1) is fairly constant over time around 30 percent. Moreover, these appear to be largely the same municipalities over time. The municipal efficiency scores obtained with the SFA approach for 2005–2007 are in Figure 4. This figure shows interesting differences in the development of efficiency for the lower and higher end of the distribution of efficiency. Comparing 2005 with 2006 and particularly 2007, shows that efficiency at the lower end of the distribution deteriorated. At the same time, comparing the same years at the higher end of the distribution yields exactly the opposite. Now, efficiency in both 2006 and 2007 improved compared to 2005. However, the overall deterioration of efficiency at the lower end outweighed the improvement and the higher end and this leads to the slightly lowering efficiency over time that was already shown in Figure 1. It is also clear that, overall, efficiency levels are highest around 2004 and 2005, but slightly fall thereafter, as confirmed in Figures 1 and 2.

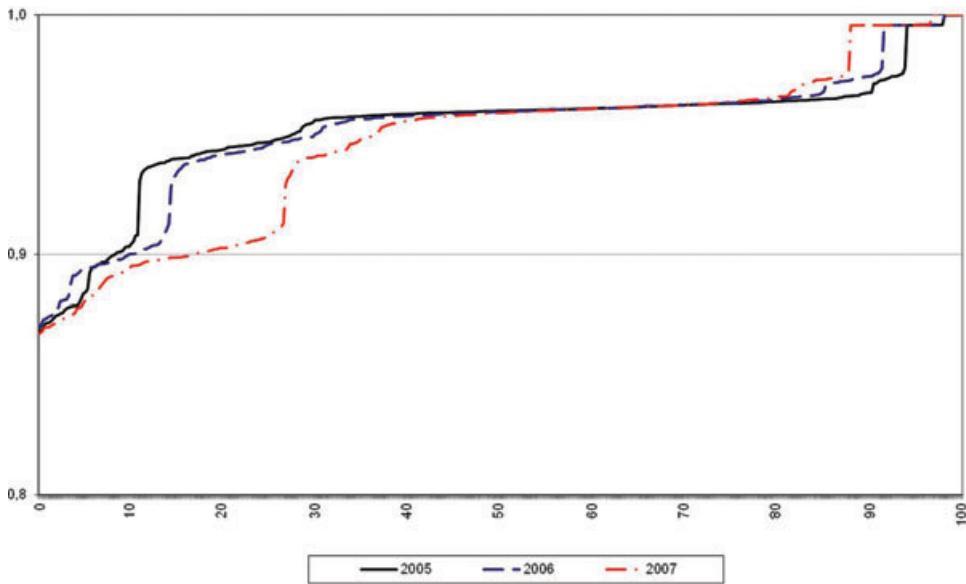


FIGURE 4: Distributions of Municipal Efficiency (Y-axis) for 2005–2007, from SFA (X-Axis: Percent of Municipalities).

The patterns of the annual efficiency scores of these figures imply that these scores change over time and partly depend on municipal policy strategies. What has happened between 2005 and 2007 is that many municipalities abandoned the option for not pursuing a particular strategy. The number of municipalities with no particular strategy dropped from 272 in 2005 to 199 in 2007. The number of municipalities with a control strategy rose from 23 in 2005 to 30 in 2007. Something similar happened with combinations of strategies, rising between 2005 and 2007 from 24 to 88 municipalities. This led to the deterioration at the lower end of the distribution in those years. At the same time the number of municipalities adopting an activation strategy doubled from 27 in 2005 to 54 in 2007. This improved the higher end of the efficiency distribution.

7. CONCLUSIONS

In the past 15 years, Dutch reforms in the legislation and administration of welfare and social assistance benefits shifted competence and financial responsibility from the national government to the local level of municipalities. As far as social assistance is concerned, these reforms culminated in the Work and Social Assistance Act in 2004. Although municipalities do not have the authority to change the actual benefit level, they can develop their own local or regional policies, like cooperation, preventing unemployment, reintegration measures, gatekeeper roles and so on. The gradual budgeting of the financial means for social assistance from 2001 to 2004, culminating in budgeting 100 percent of the costs of social assistance and reintegration to municipalities should give them enough incentives to act efficiently. So, the research question is whether Dutch municipalities have become more efficient in managing the costs of social assistance dependency.

Three conclusions can be drawn from our analysis. First the overall level of efficiency has improved. DEA shows a clear break in cost efficiency in 2004. Hence the WSA did improve municipal cost efficiency of social assistance. After 2004 the improvement slowly

seems to leak away. The outcome of the DEA was very robust for other inputs used in the analysis.

Second, SFA shows that municipal policy strategies do matter in improving cost efficiency of social assistance. We found that in the period 2005–2007 particularly a strategy of activating social assistance benefit recipients improved efficiency. Other strategies notably control and combinations of different strategies have had a lowering effect on cost efficiency. The changes in the distribution of efficiency in the period 2005–2007 can be explained by the changing policy mix that municipalities pursue during that period.

Third the fact that some policy strategies contribute to increasing cost efficiency while others do not, is related to economic and regional circumstances. In periods of strong job growth with a lot of open vacancies, many social assistance recipients move relatively easy into employment. In these circumstances control is not as effective as in less favorable periods when recipients put less effort in job search with the argument that no jobs are available. Activation on the other hand seems to give the right push to enter the labor market.

To conclude, the overall efficiency is already very high in The Netherlands with a value around 95 percent. Hence, there is influence of municipal policy, as we have seen, but this effect is small. After all, about 95 percent of the social assistance expenditures in the period 2005–2007 are determined by the inputs, i.e., factors that are not directly at the municipality's discretion. This confirms our research of the total policy effects on the in- and outflow of social assistance (Broersma et al., 2011). Because of that, the margins at which efficiency improvement could take place are very small.

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DATA APPENDIX—MODEL VARIABLES

Name	Short Description	Source
Expenditures social assistance 2004–2007	Total of expenditures on social assistance to persons <65 years of age. All municipalities	Ministry of Social Affairs
Expenditures social assistance 2001–2003	25 percent expenditures on social assistance to persons <65 years of age. All municipalities	Ministry of Social Affairs
HH_single parent	Share of single-parent households in total number of households	Statistics Netherlands
POP_minority	Share of minorities of non-Western descent in total population	Statistics Netherlands
HH_low income	Share of households with income at the lowest 4 deciles of the national income distribution	Statistics Netherlands
Size	Size of municipalities in total number of inhabitants	Statistics Netherlands
POP_low edu.	Share population between 15 and 64 with a low education (at most ISCED 3)	Statistics Netherlands
POP_unempl. insurance	Share of persons between 15 and 64 with a UI benefit	Statistics Netherlands
Vacancy/Unemployment	Ratio of vacancies and unemployed labor force in the COROP-region (NUTS3) the municipality is in	Statistics Netherlands
Jobs	Ratio of jobs and the population between 15 and 64	Statistics Netherlands
Addresses/Km ²	Number of addresses per km ²	Statistics Netherlands
Fraud cases	Share of fraud cases in average number of persons on social assistance	Divosa and Statistics Netherlands
Wajong-inflow	Ratio of inflow in Wajong arrangement and population between 15 and 64 (at start of period)	Statistics Netherlands
WSW-inflow	Ratio of inflow in WSW and population between 15 and 64 (at start of period)	Ministry of Social Affairs and Statistics Netherlands
Nonsubsidized courses	Ratio of reintegration courses and population between 15 and 64	Statistics Netherlands
Subsidized employment	Ratio of subsidized reintegration courses and population between 15 and 64	Statistics Netherlands

Continued

DATA APPENDIX: Continued

Name	Short Description	Source
Growth rate of establishments	Percentage growth rate of number of establishments per municipality	Statistics Netherlands
Expenditures on economic affairs	Total municipal expenditures on economic affairs per capita	Statistics Netherlands
