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Measuring the Effectiveness of Public Employment Service (PES) Workers

An Empirical Analysis Based on the Performance Outcomes of Regional Employment Offices

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Abstract in English

In this paper, we measure the effectiveness of the Dutch public employment service (PES) for various performance measures, ranging from outflow rates to the timeliness of the benefits allocation. Using unique administrative monthly data from local PES offices during 2004, we exploit the fact that the number of PES workers per job seeker varies substantially between offices. We find additional PES workers to significantly increase outflow rates for short term unemployed and unemployment insurance (UI) recipients. In contrast, no effects are obtained for the outflow rates of long term unemployed and social assistance (SA) recipients. We also find additional PES workers to reduce the inflow into the schemes, to improve the timeliness of UI benefits and to increase the number of vacancies that are registered by offices. Although the effectiveness of PES workers is limited, we conclude that changes in the number of PES workers per client are cost-effective ─ that is, the extra costs are compensated for by the resulting reduction in benefit expenses.

Key words: public employment service, project evaluation

JEL code: H83, H43

Abstract in Dutch

Deze studie onderzoekt de effectiviteit van (extra) werknemers bij CWI-kantoren. Effectiviteit kent daarbij verschillende dimensies, variërend van de uitstroom van werkzoekenden tot tijdigheid van verstrekte uitkeringen. Het aantal CWI-werknemers per klant varieert duidelijk over de tijd en tussen CWI-kantoren. Deze variatie is deels het gevolg van een verkeerde inschatting van het aantal klanten per kantoor. Het is daarom zaak om bij schatting van de effectiviteit van werknemers te controleren voor locale arbeidsmarktomstandigheden. De schattingsresultaten die dit oplevert zijn in lijn met de doelgroep waar het CWI primair verantwoordelijk voor is: extra CWI medewerkers leiden tot meer uitstroom van kortdurend werklozen (en zo tot preventie van langdurige werkloosheid), een meer tijdige afwikkeling van cliënt-*intakes*, een strengere poortwachtersfunctie en een hoger vacaturebereik. De effecten van extra CWI-medewerkers zijn in het algemeen bescheiden, maar zijn voldoende om tot kosten-effectiviteit te komen. Dat wil zeggen: de kosten van extra personeel worden gecompenseerd door uitkeringsbesparingen door meer preventie en uitstroom.

Steekwoorden: CWI, effectmeting, kosten-baten-analyses

Een uitgebreide Nederlandse samenvatting is beschikbaar via www.cpb.nl.

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Summary

In most OECD countries, there are ongoing debates on the organisation of employment services. Typically, this debate addresses the usefulness of *public* employment services (PES). So far, empirical evidence here is mixed. When taking a micro-perspective, there is a growing body of research that stresses the effectiveness of counselling and monitoring activities of the PES. Thus, one may loosely argue that the PES is beneficial for society as well. At the same time, macro-level studies often doubt the usefulness of public sector intervention to increase matching efficiency. From a welfare point of view, subsidising job search activities of unemployed individuals facilitates the search process for employers (i.e. positive externalities), but it reduces the job finding opportunities of other unemployed individuals (i.e. negative externalities). The evidence suggests that both externalities are of equal size, suggesting that job search intervention is not welfare improving. In order to bridge the gap between these two strands of literature, the perspective of PES activities therefore needs to be broader than the conventional job matching process. PES offices usually carry out various tasks, with job search assistance as only one of them. PES offices also may initiate monitoring and sanctioning activities, as well as the intake and benefit administration of new clients.

In the literature, issues relating to the governance structure of employment services, as well as the performance of PES offices in a broader sense, are largely unaddressed. Usually the effectiveness of interventions is considered to be instrument-specific, while ignoring the organisation of these activities. Typically, empirical studies evaluate the effectiveness of specific interventions on one specific outcome, i.e. the job finding rate. From such studies, one cannot make inference on the value added of the PES as a whole, let alone the value added on performance outcomes other than the return to work rate. This paper intends to fill this gap ─ that is, we measure the effectiveness of the Dutch public employment service (PES) for a variety of outcome measures. In particular, we use information on outflow rates, timeliness scores of the benefit administration, outcome measures relating to the gate-keeping activities, and the number of vacancies that are registered by the offices.

When estimating the effectiveness of additional PES workers, we basically exploit aspects of the budgeting formula that is used for local PES offices. We circumvent the apparent endogeneity of the worker client ratio per office by exploiting a simple budgeting rule that is used by the central PES office: the number of workers per office is equal to the product of the standard time per client and the estimated number of clients. Under the assumption that under- or overestimates of the number of full time worker equivalents are erroneous, we argue that including the number of unemployed clients per office as a control is sufficient to obtain consistent estimates of the effectiveness of PES workers.

Our estimation results on the effectiveness of additional workers mirror the sphere of activities that the PES offices primarily bear the responsibility for ─ that is, the intake, benefit administration, and counselling and monitoring activities for short term unemployed workers. First, we find a higher worker/client ratio at offices to increase the outflow rates for short term unemployed, which prevent this category from being long term unemployed. Second, we find a higher worker/client ratio to increase the timeliness of UI benefits, but not for SA benefits. This reflects the fact that UI recipients are overrepresented in the sub-sample of short term unemployed. Third, we find the prevention quotes of only UI applications to increase with respect to the number of workers per client, indicating that the additional working time is used to tighten the eligibility criteria ("Work First"). Finally, our results suggest that PES workers are quite effective in attracting and registering vacancies. These, however, mostly concern vacancies already being posted by employers.

Generally, the effects of additional workers per client on the various performance outcomes are only modest ─ it seems that local labour market conditions are much more important in determining local outflow rates. When supposing for instance that the worker/client ratio's for all offices are increased by 1%, this would increase the overall monthly outflow rate only by 0.041%. Comparing the effects on benefit expenses with the costs of additional workers, however, the picture that emerges is that PES offices are cost-effective. Under the assumption that we have as steady state value of the stock of PES clients, we find a 1% increase in the worker/client ratio to decrease the total UI and SA benefit costs with 0.056%, whereas an increase of 0.037% would be needed to compensate for the accompanying worker costs. This implies a benefit/costs ratio of about 1.4.

1 Introduction

In most OECD countries, there are ongoing debates on the organisation of employment services. Typically, this debate particularly addresses the usefulness of *public* employment services (PES) in two aspects. The first question usually relates to the division of tasks between public bodies: should services be provided by public employment services exclusively, or together with the administration of benefits (see e.g. Martin, 2000)? Second, more recent debates take a broader perspective, and address the issue of privatisation of various employment services. Examples of countries where privatisation is actually enforced include Australia and the Netherlands (see e.g. OECD, 2006). Here, welfare-to-work services that are publicly financed are now procured to private organisations.

In the literature, the empirical evidence on the use and usefulness of the PES is mixed. When taking a micro-perspective, there is a growing body of research that stresses the effectiveness of counselling and monitoring activities of the PES. Kluve (2006), who surveys the literature for European countries, finds 'services and sanctions' to be relatively effective, particularly when compared to the costs of these measures. Kluve argues that job search courses, job clubs, vocational guidance, counselling and monitoring and sanctions are all activities that usually are carried out by the PES. Thus, one may loosely argue that the PES is beneficial for society as well. At the same time, macro-level studies often doubt the usefulness of public sector intervention to increase matching efficiency. From a welfare point of view, subsidising job search activities of unemployed individuals facilitates the search process for employers (i.e. positive externalities), but it reduces the job finding opportunities of other unemployed individuals (i.e. negative externalities). Petrongolo and Pissarides (2001) argue that both externalities are of equal size ─ i.e. there are constant returns to scale ─ suggesting that job search intervention is not welfare improving. Thus, private intermediaries, employers and job seekers will invest optimally in search activities.

In order to bridge the gap between these two strands of literature, the perspective of PES activities needs to be broader than the conventional job matching process. PES offices usually carry out various tasks, with job search assistance as only one of them. PES offices also may initiate monitoring and sanctioning activities, as well as the intake and benefit administration of new clients. In the Netherlands, the PES is also responsible for preventing unemployed to become benefit recipients ─ that is, prior to receiving unemployment insurance or social assistance, applicants should already have looked for job opportunities. These activities are commonly labelled as 'Work First'. In the literature, however, issues relating to the governance structure of employment services, as well as the performance of PES offices in a broader sense, are largely unaddressed. Usually the effectiveness of interventions is considered to be instrument-specific, while ignoring the organisation of these activities. Typically, empirical

studies evaluate the effectiveness of specific interventions on one specific outcome, i.e. the job finding rate. From such studies, one cannot make inference on the value added of the PES as a whole, let alone the value added on performance outcomes other than the return to work rate.

This paper intends to fill this gap ─ that is, we measure the effectiveness of the Dutch public employment service (PES) for a variety of outcome measures. In particular, we use information on outflow rates, timeliness scores of the benefit administration, outcome measures relating to the gate-keeping activities, and the number of vacancies that are registered by the offices.[1] Thus, we do not only address conventional performance outcomes, but also those relating to the quality of the benefit administration process. With this information, we assess the cost-effectiveness of (additional) PES workers, using outcome measures that can be expressed in monetary terms. In doing this, we follow recent calls by e.g. the OECD (2005) to assess the role of PES interventions more systematically. Moreover, we pay special attention to the role of the PES in attracting and registering vacancies. Following the arguments of the matching literature, one may expect these activities to have deadweight effects. To assess the importance of these effects, we also estimate the effectiveness of PES workers in terms of increases the *total* number vacancies in local markets, rather than increases in the *share* of vacancies that is registered at the PES.

When estimating the effectiveness of additional PES workers, we basically exploit aspects of the budgeting formula that is used for local PES offices. More specifically, we circumvent the apparent endogeneity of the worker client ratio per office by exploiting a simple budgeting rule that is used by the central PES office: the number of workers per office is equal to the product of the standard time per client and the estimated number of clients. Under the assumption that under- or overestimates of the number of full time worker equivalents are erroneous, we argue that including the number of unemployed clients per office as a control is sufficient to obtain consistent estimates of the effectiveness of PES workers.

In what follows, in section 2 we will first explain and describe the data sources we have employed in this analysis, as well as the role the Dutch PES offices have. Sections 3 and 4 describe the research design and estimation results, respectively. Section 5 concludes.

[1] To our knowledge, the study of Burgess et al (2004) is one of the few that also addresses both the quantity and quality perspective of PES activities. In particular, they study the effectiveness of performance schemes for local offices in terms of job placement rates, customer service, employer service, other business delivery functions and reducing benefit calculation error and fraud.

2 Policy context and data

In the Netherlands, unemployed workers may be entitled to benefits either by the unemployment insurance (UI) scheme or by the social assistance (SA) scheme. Statutory UI benefits cover 70% of the last earned wage, with entitlement periods that are strongly related to individual working experience. In particular, during the period of investigation the UI benefit period could vary between six months to five years.[2] The UI scheme is carried out by the social benefit administration (UWV), an independent public body. If workers are not, or no longer entitled to UI benefits, and do not have any partner income, they are in principle entitled to SA benefits. The level of SA benefits is equal to the social minimum, which is 70% of the statutory Minimum Wage. The administration of SA benefits is carried out by municipalities, who in principle are lump sum financed by the central government. As a result, municipalities have substantial incentives to reduce SA costs.

The PES ─ in Dutch: Centre for Work and Income (CWI) ─ consists of about 130 local offices that serve both the social benefit administration as well as the municipalities. [3]For the most part, these services relate to the first six months of unemployment, both for UI and SA recipients. In particular, PES offices carry out the intake of new clients, attract and register vacancies of employers, and take care of counselling and monitoring activities of clients. After the six-months time window, UWV and municipality offices are in principle responsible for offering welfare-to-work trajectories, but may still decide to delegate counselling and monitoring services to PES offices. Thus, although PES offices have a legal task in providing the intake and re-employment activities for short term unemployed, in practice they may also provide services to long term unemployed.

For our analysis, we use administrative data that are derived from the PES benchmarking system, and combine this with client information. We restrict the attention to 2004, which is the first and only year for which we have full information on the number of workers per office.[4] Table 2.1 reports the characteristics of the resulting data set of 132 regional offices, for which we observe monthly information on client characteristics, the number of workers and various performance scores. Client characteristics concern the duration composition (short and long term unemployed), gender, age, education level and nationality of origin. The data set contains similar client characteristics for the sub-samples of long and short term unemployment, respectively; for expositional reasons, we do not report these in the table; in what follows, however, we use the composition variables of these sub-samples as controls in specifications for the outflow rates of the short and long term unemployed, respectively.

[2] In order to be eligible for UI, workers should have paid UI premiums for 48 months in the previous 60 months. Until 2007, for workers of 57,5 years and older, the entitlement period in principle was 5 years.

[3] See De Koning (2004) for a more extensive description on the system the Dutch PES operates in, as well as its history.

[4] The PES benchmarking system has been initiated in 2003 (see e.g. CWI, 2005a).

In the data set, the number of workers per office is observed in full time equivalents; this number ranges from 3.1 to 81.5 workers per office, with the corresponding average number of unemployed job seekers in these areas equal to about 290 and 4,740, respectively. On average, there is eight PES workers for each 1,000 clients. Estimates of the number of vacancies in the regions of local offices are derived for surveys of the Central Bureau of Statistics.

The performance of individual PES offices is measured along various dimensions (CWI, 2004). Obviously, these measures are predominantly related to the first six months of unemployment of UI and SA benefit recipients: (i) the intake ('prevention quotes'); (ii) the provision of intake information to UWV and municipalities (timeliness); (iii) the registration rate of vacancies; and (v) various outflow rate measures.

First, prevention quotes are defined as the number of (initial) benefit denials at PES offices. In particular, prior to the benefits claim, UI and SA applicants should have performed sufficient job search activities.('Work First'). In 2004, on average 17% of UI applicants did not (directly) meet the job search requirements, whereas for SA applicants this percentage amounted to 41%.

Second, PES offices have to meet conditions regarding the time interval between intake and the actual delivery of client information to UWV and the municipalities, so as to make sure that clients receive their benefits in time. Thus, performance indicators are labelled here as 'timeliness' measures. In the data, the average timeliness scores for SA recipients are amounting to 95%, and 83% for UI recipients. Additionally, timeliness scores of PES offices vary substantially, from 30% (40%) to 100% (100%) for UI (SA) recipients.

Third, PES aims at a sufficiently high level of vacancies that is actually registered at the offices, so as to facilitate the matching process of clients and vacancies. This number is normalised by the (estimated) total number of vacancies in the relevant area. On average, about 36% of vacancies was registered in 2004, with substantial variation between offices (from 9 tot 95%). Here, it is important to note here that vacancy coverage is the only performance measure that is measured only once, and refers to the first half year of 2004.

Table 2.1 Descriptive monthly statistics of PES offices, averages in 2004

	Mean	St. dev.	Observations
stock of unemployed clients	5551	3627	1584
stock of unemployed < 6 months (short term unemployment)	1617	982	1584
stock of unemployed ≥ 6 months (long term unemployment)	3934	2725	1584
Age, gender (fractions of client population)			
male	0.51	0.030	1584
24-26 years	0.097	0.021	1584
27-29 years	0.12	0.019	1584
30-39 years	0.26	0.022	1584
40-49 years	0.24	0.017	1584
50-57.5 years	0.16	0.019	1584
> 57.5 years	0.12	0.027	1584
Education			
Lower	0.16	0.055	1584
Middle	0.32	0.041	1584
Higher	0.35	0.055	1584
University	0.11	0.033	1584
Unknown	0.050	0.037	1584
Ethnicity			
Antilles, Aruba	0.013	0.019	1584
Morocco	0.036	0.040	1584
Surinam	0.022	0.038	1583
Turkey	0.047	0.045	1548
Other	0.11	0.043	1584
Vacancies and office characteristics			
Number of vacancies	316	240	1548
Vacancies per client	0.077	0.073	1548
Number workers per office	30.6	15.5	1548
Worker-client ratio (x1,000)	8.0	10.8	1548
Worker-client ratio for short term unemployed only (x1,000)	26.0	30.4	1548
Performance outcomes			
Outflow rate	0.085	0.026	1570
Outflow rate short term unemployment (<6 months)	0.18	0.054	1572
Outflow rate long term unemployment (> 6 months)	0.045	0.019	1570
Outflow rate UI recipients in previous six months	0.53	0.17	1567
Outflow rate SA recipients in previous six months	0.53	0.19	1567
Prevention quote Unemployment Insurance (UI)	0.17	0.065	1567
Prevention quote Social Assistance (SA)	0.41	0.16	1567
Timeliness score Unemployment Insurance recipients (UI)	0.83	0.10	1567
Timeliness score Social Assistance recipients (SA)	0.95	0.064	1567
Vacancy coverage (i.e. estimated share that is registered)	0.36	0.16	774

Fourth, for each individual PES office five outflow statistics are recorded: the overall monthly outflow rate for the stock of clients; the monthly outflow rates for the stock of clients that is no longer unemployment than six months ('short term unemployed'); the monthly outflow rate of the stock of clients that is unemployed for six months or longer ('long term unemployed'); the percentage of UI clients that have returned to work in the previous six months; and the percentage of SA clients that have returned to work in the previous six months. [5] As expected, the average monthly outflow rate of short term unemployed (18%) is substantially higher than for long term unemployed (4.5%). When converting the average monthly outflow rate of PES clients in terms of six months, the resulting percentage (60%) matches the UI and SA rates (both about 53%) reasonably well. Of the five outflow scores, it is the rate for short term unemployed that can be labelled as the primary client group of the PES. As a result, the outflow scores of the long term unemployed are not used as actual outcome measures. For two reasons, however, we do not restrict our attention to short term unemployed only. First, and as stated earlier, it is important to note that PES offices may still be in service for UWV and municipalities ─ job search activities do not end after six months of unemployment, and PES offices are the most important provider of job opportunities. Second, it may well be that the effects counselling and monitoring interventions materialise after six months of unemployment, thus affecting long term unemployment as well.

[5] Note that both short and long term unemployed do not only include UI and SA recipients, but also job seekers not receiving any benefits.

3 Research design

The key question to be addressed in this paper is with respect to the effectiveness of additional PES workers per client on various performance measures. Now, for expositional reasons, we first concentrate on the outflow rate as the primary performance measure of interest, the reason being that this variable is most likely to be susceptive to endogeneity biases. We specify a model that relates the log outflow rate of PES clients, *JPR* , of PES office with indicator *i* at time *t* to the log value of the number of workers per client ('worker/client ratio'), *WCR*, as well as other explanatory variables (represented by matrix ***X***). Furthermore, *e* represents the residual value, which is assumed to be independently and identically distributed, and scalar *a* and vector ***b*** are coefficients describing the impact of *WCR* and ***X***, respectively. We refer to the resulting specification as the 'benchmark model':

$$\ln JPR_{it} = a \ln WCR_{it} + \boldsymbol{X_{it}}\boldsymbol{b} + e_{it} \quad (1)$$

In order to obtain consistent estimates of the elasticity of the outflow rate vis-à-vis PES workers per client ─ the parameter *a* ─ the residual terms *e* should not be correlated with worker/client ratio. To assess the validity of this assumption, it is instructive to look at the allocation of personnel to offices. Here, the simple, basic allocation rule of the central PES is that the number of workers per PES office at a specific moment of time is equal to a standard, nationwide worker/client ratio, times the estimated number of clients. As a result, one source of variation in the actual work client ratio numbers across PES offices stems from prediction errors in the number of clients per office. A second source of variation relates to practical delays in the allocation process: major reallocations of PES workers occur in principle only once in every six months. Moreover, such reallocations are mostly partial, causing differences in worker/client ratio's to be rather persistent.

We formalise these two arguments by rewriting $\ln WCR_{it}$, and introducing some additional notation: *W* as the number of workers per office, *U* as the actual number of clients, U_{pred} as the predicted number of clients, $WCR_{standard}$ as the standard, nationwide worker/client ratio and WCR_{plan} as the planned worker/client ratio per office. We assume the standard, nationwide worker/client ratio to be constant over time.[6] Thus, we have

$$\begin{aligned} \ln WCR_{it} &= \ln W_{it} - \ln U_{it} = \quad (2) \\ &= [\ln W_{it} - \ln U_{pred;it}] + [\ln U_{pred;it} - \ln U_{it}] = \\ &= \ln WCR_{plan;it} + [\ln U_{pred;it} - \ln U_{it}] = \\ &= \ln WCR_{standard} + [\ln WCR_{plan;it} - \ln WCR_{standard}] + [\ln U_{pred;it} - \ln U_{it}] \end{aligned}$$

[6] We argue that this assumption is not restrictive, as the time interval under consideration is only one year.

Equation (2) formalises the variation in the log value of *WCR*. First, differences between actual en standard worker/client ratio may be due to delays in the implementation of the allocation formula. This is reflected by the second component of the equation, i.e. the planned *WCR* is not set instantly equal tot he standard, nationwide *WCR*. Second, there may be differentials between the actual and *ex ante* predicted (log) number of clients per office at time *t*; this is reflected by the third component of the equation. Unfortunately, in our data we do not observe the estimated number of clients per offices. As a result, we cannot separately identify the two sources of variation that are exploited to estimate worker effectiveness.

Clearly, the second source of variation in the worker/client ratio ─ that is, prediction errors in the number of clients per office ─ is likely to be endogenous, leading to inconsistent estimates of worker effectiveness. In particular, if the actual number of clients exceeds the predicted number of clients, the number of workers per client will decrease correspondingly. Obviously, only a part of the variation in actual client numbers can be explained by model assumptions. Thus, without controlling for the actual number of clients ─ or more general measures of labour market tightness ─ worker effectiveness will be overestimated.

To test for the presence of prediction errors in client numbers, as well as the persistency of variation in worker/client ratio's, we estimate the (log) worker/client ratio vis-à-vis the number of clients per offices in a GLS model where we allow for serial (autoregressive) correlation. In this specification, we also include the control variables $\boldsymbol{X}$ (i.e. gender, education levels, age categories and ethnicity).[7] Table 3.1 reports the resulting coefficient estimates. The first thing to note here is that prediction errors indeed are important. When the variation in the number of clients is fully compensated by workers that are hired, this should yield a coefficient estimate of the log value of unemployed clients equal to zero. Instead, we find an estimated coefficient of ─0.67 (0.056).[8] Thus, predicted client numbers per office only partially capture the actual variation in client numbers; in order to estimate equation (1) consistently, we need a measure for labour market tightness as a proper control variable.

Table 3.1 also makes apparent that the unexplained variation in worker/client rates across offices is highly persistent ($\rho = 0.91$). In particular, the estimated autoregressive coefficient implies that it takes almost seven months for these differences to halve. This means that variation in worker/client ratio's does not only result from (ex post) prediction errors, but also delays in the allocation process. Finally, Table 3.1 shows that offices with particular client types are not favoured or disfavoured systematically. Particularly the F-tests on subsets of parameter

[7] We also estimated a specification where calendar time dummies for months where included. The explanatory power however was negligible, with an F-statistic equal to 0.40 (P=0.95).

[8] Note that for this coefficient an almost equal estimate is obtained when no (other) controls are included.

coefficients of clients characteristics make this clear; there are only two immigrant groups that have significant coefficients, but the effective impact is only small.

To sum up, we may safely conclude that proper, office-specific labour market tightness or business cycle variables are needed to estimate worker effectiveness. Related to this, for consistent estimation we particularly have to rely on exogenous variation in the worker/client ratio that stems from substantial delays in the allocation process.

Table 3.1 GLS regression for the log worker/client ratio (N=1511; 125 clusters)

		Coefficient
log number of clients per office	–0.67**	(0.06)
constant	1.02	(2.34)
Gender and age		
male	–0.92	(1.07)
24-26 years	0.10	(5.33)
26-29 years	0.52	(7.23)
30-39 years	–1.13	(2.36)
40-49 years	0.95	(3.33)
50-57.5 years	–2.40	(2.61)
≥ 57.5 years	2.18	(2.74)
Education		
lower	–0.24	(1.05)
middle	0.22	(0.91)
higher	–0.76	(1.50)
university	2.00	(1.59)
unknown	–1.72	(2.05)
Ethnicity		
Antilles, Aruba	0.69	(1.80)
Morocco	0.60	(0.59)
Surinam	–2.08**	(0.89)
Turkey	–0.63	(0.91)
other	1.46*	(0.84)
F-test on age coefficients	F(6,125) = 0.77	P = 0.59
F-test on education coefficients	F(5,125) = 0.98	P = 0.43
F-test on ethnicity coefficients	F(5,125) = 1.58	P = 0.17
Serial correlation coefficient residuals	0.91	
Explained variance	0.47	
Explained variance due to log number of clients	0.45	
Explained variance due to client characteristics	0.020	

Standard errors between parentheses; ** and ** denote significance at level of 1% and 10%, respectively.

4 Estimation results

4.1 The benchmark model

As we have argued in the previous section, consistent estimates of worker effectiveness can be obtained for the 'benchmark model' by using standard techniques, as long as proper controls for labour market tightness are included. For this purpose, we use the log value of the quotient of vacancies and the number of unemployed PES clients per office. For the outflow scores, the resulting coefficient for this variable can then be interpreted as the share coefficient of vacancies in a standard Cobb Douglas function of the unemployment-vacancy (UV) curve with constant returns to scale.[9]

Tables 4.1 and 4.2 report the GLS estimation results for the outflow rates as performance outcomes, and the timeliness, prevention and vacancy coverage scores, respectively. As we have discussed in Section 2, these estimates are obtained for monthly observations of 124 PES offices in 2004. Furthermore, it should be noted that the estimated coefficients are corrected for clustering effects within PES offices.

Before discussing the effectiveness of the worker/client ratio for the specific outcome measures, we first address the interpretation of the coefficients describing the impact of the client characteristics (age, gender, education level and ethnicity). The coefficients that are obtained for these variables should be interpreted with caution, as they are susceptive to two types of selection effects. First, clients that are registered at the PES offices are typically a selection of job seekers with hidden characteristics that make them more or less likely to find a job. Particularly when stratifying the sample into short and long term unemployed, such effects may be important. For instance, for the sub-sample of workers that are long term unemployed we find PES offices with a relatively high fraction of job seekers with a university degree to have a low outflow rate (see Table 4.1). It may well be that this particular sub-sample of workers has hidden characteristics worsening their labour prospects, rather than that we measure the true impact of having a university degree. Selection effects may also result from the distribution of job seeker types over specific regions. For instance, older aged workers may live in regions that have better labour market opportunities. In that case, the effect of age on outflow rates will be overestimated.

[9] The assumption of constant returns to scale is in accordance with e.g. the survey study of Petrongolo and Pissarides (2001), as well as Broersma and Van Ours (1998), who focus on the Dutch labour market.

Although various coefficients are likely to be biased as a result of these two selection effects, we argue that this will not affect our parameters of interest ─ that is, the effectiveness of the worker/client ratio, as well as the parameter describing the effect of the labour market tightness. As we have shown in the previous section, the allocation of workers across PES offices is only (significantly) affected by the number of clients, and not by its composition. Thus, client characteristics will in principle only increase the fit of the model, rather than being crucial for the estimation of the effectiveness of the worker/client ratio.[10]

Table 4.1 GLS estimation results benchmark model: outflow rates as performance outcomes

	(i) all clients		**(ii) short term unemployed**		**(iii) long term unemployed**		**(iv) UI recipients**		**(v) SA recipients**	
log worker/ client ratio	0.041**	(0.012)	0.025*	(0.013)	0.004	(0.019)	0.025**	(0.008)	0.017	(0.012)
log vacancies / unemployed	0.13**	(0.01)	0.10**	(0.02)	0.11**	(0.02)	0.02*	(0.01)	─0.01	(0.02)
Age, gender										
male	─0.74*	(0.35)	─1.60**	(0.24)	1.84**	(0.48)	─0.30	(0.29)	─1.43**	(0.48)
24-26 years	2.45	(1.89)	0.50	(0.85)	─0.59	(3.08)	3.40*	(1.36)	5.96**	(2.25)
27-29 years	0.57	(1.86)	2.18*	(1.01)	4.75*	(2.48)	1.69	(1.64)	3.67	(2.43)
30-39 years	1.82*	(0.79)	0.67	(0.48)	5.46**	(1.16)	1.37	(0.91)	2.38*	(1.04)
40-49 years	1.84*	(0.88)	1.17*	(0.53)	5.29**	(1.54)	2.34**	(0.71)	4.03**	(1.19)
50-57.5 years	1.37	(0.87)	2.46**	(0.64)	1.67	(1.31)	1.94*	(0.86)	3.63**	(1.25)
> 57.5 years	0.91	(0.79)	─0.72	(0.84)	3.21*	(1.29)	2.30*	(0.64)	2.52*	(1.09)
Education										
Lower	0.66	(0.43)	1.65**	(0.33)	─0.11	(0.60)	0.35	(0.40)	─0.85*	(0.50)
Middle	0.61*	(0.29)	0.76**	(0.22)	1.31**	(0.45)	0.44	(0.31)	─0.13	(0.41)
Higher	0.68	(0.49)	0.50	(0.42)	0.89	(0.79)	─0.10	(0.46)	─0.28	(0.55)
University	─0.13	(0.50)	0.40	(0.39)	─1.53*	(0.84)	─0.33	(0.48)	─0.49	(0.60)
Unknown	2.28**	(0.49)	1.35**	(0.31)	2.99**	(0.73)	0.055	(0.35)	─0.56	(0.66)
Ethnicity										
Antilles, Aruba	─1.50*	(0.86)	─1.70*	(0.72)	1.13	(1.32)	0.39	(0.52)	1.58*	(0.68)
Morocco	─0.067	(0.23)	─0.80**	(0.24)	0.61*	(0.36)	─0.21	(0.24)	─0.17	(0.28)
Surinam	0.12	(0.33)	─1.45**	(0.34)	1.96**	(0.48)	─0.93**	(0.34)	─0.07	(0.40)
Turkey	0.64**	(0.24)	0.83**	(0.26)	0.62	(0.38)	0.48*	(0.26)	0.23	(0.30)
Other	0.22	(0.28)	1.43**	(0.42)	─0.29	(0.39)	0.32	(0.29)	─0.95*	(0.45)
Constant	─3.10**	(0.75)	─2.20**	(0.39)	─7.70**	(1.27)	─2.21**	(0.67)	─2.40*	(0.96)
R-squared	0.19		0.20		0.13		0.35		0.12	
Monthly office observations	1485		1487		1486		1369		1365	

Standard errors between parentheses. **and * denote significance at the level of 1% and 10%, respectively.

[10] For all performance outcomes, we also re-estimated the benchmark model without client characteristics as controls. As expected, this did not change the estimated coefficient of the worker/client ratio for any of them.

When considering the worker/client ratio coefficients for the five outflow rates at hand, the picture that emerges is that the effectiveness of additional workers is relatively high (and significant) for the sub-sample of short term unemployed clients and that of UI recipients. In particular, a 1% increase in the number of workers is found to increase the outflow rate for both the short term unemployed and UI recipients with 0.03%, which corresponds to an increases of 0.005 and 0.013 percentage point, respectively.[11] [12] In addition, and perhaps surprisingly, we find the effect on the total outflow rate to be 0.04%, corresponding to an effect of 0.004 percentage point. This effect even exceeds that for the sub-sample of short term unemployed, suggesting that the effectiveness of additional workers on clients results in less (inflow of) clients becoming long term unemployed as well.

The findings for the outflow rates basically reflect the primary sphere of activity of the PES offices, that is, the population of short term unemployed. UI recipients are overrepresented in this category of unemployed clients, which explains the higher effectiveness vis-à-vis SA recipients Still, one may conclude that the effects of additional workers, albeit significant, are only modest. Instead, it seems that labour market tightness is a much stronger determinant of the variation of local outflow rates. We find the share coefficient of vacancies here to be equal to 0.13 (0.014) for the full sample. This value is lower than in the matching literature (see e.g. Petrongolo and Pissarides (2001)). A possible explanation for this may be nature of the vacancy data we use ─ as these data are obtained from surveys, they are likely to be measured with error. We return to this issue when testing the robustness of our estimation results.

[11] Note that the outflow rate of UI and SA recipients is measured for a time window of six months. When recalculating these rates in terms of monthly units, the effects are close to those for short term unemployment.

[12] With the same data, Van Donk and De Koning (2005) estimate elasticities for short term unemployment that are substantially larger, with point values ranging from 0.2 to 0.6. In their model, however, local labour market conditions are controlled for by the *registered* vacancy numbers (not *absolute*). As a result, the effectiveness of the worker client ratio is very susceptive to endogeneity biases that lead to overestimation. In particular, vacancies are measured with substantial error and residual variation in outflow rates that is due to local labour market conditions will be substantial. Additionally, Van Donk and De Koning specify the outflow rate to have increasing returns to scale in the worker client ratio, which yields ── given the substantial variation in the log value of this ratio ─ rather counterintuitive results.

Table 4.2	GLS estimation results of benchmark model, continued: timeliness, prevention quotes and vacancy coverage as performance outcomes									
	(vi) timeliness UI recipients		(vii) Timeliness SA recipients		(viii) Prevention quote UI		(ix) Prevention quote SA		(x) Vacancy Coverage	
log worker / client ratio	0.015**	(0.005)	–0.000	(0.003)	0.067**	(0.016)	0.029	(0.018)	0.97**	(0.18)
log vacancies / unemployed	–0.02*	(0.01)	–0.01**	(0.00)	0.12**	(0.03)	0.10**	(0.03)	–0.25**	(0.06)
Age, gender										
male	0.56**	(0.15)	0.21**	(0.07)	–5.63**	(0.72)	–4.75**	(0.84)	1.48	(1.15)
24-26 years	2.01*	(0.95)	–0.74	(0.53)	18.33**	(3.71)	20.23**	(4.11)	12.50*	(6.26)
27-29 years	2.36*	(0.92)	–0.095	(0.47)	3.00	(3.87)	9.26*	(4.26)	2.15	(6.33)
30-39 years	1.76**	(0.52)	0.27	(0.20)	3.38	(1.52)	5.54**	(1.83)	2.65	(3.07)
40-49 years	1.19*	(0.50)	–1.37**	(0.27)	14.37**	(1.93)	18.87**	(1.97)	5.77*	(3.75)
50-57.5 years	2.67**	(0.52)	0.44*	(0.18)	6.47**	(1.74)	9.20**	(2.12)	2.93	(3.65)
> 57.5 years	1.80**	(0.47)	–0.077	(0.21)	4.75**	(1.41)	7.40**	(1.65)	5.64*	(3.37)
Education										
Lower	0.064	(0.17)	–0.59**	(0.098)	–3.55**	(1.42)	–2.81**	(0.86)	0.24	(1.41)
Middle	0.35*	(0.14)	–0.075	(0.084)	–1.74**	(0.63)	–0.47	(0.71)	–0.12	(1.39)
Higher	–1.07**	(0.24)	–0.22*	(0.13)	–0.37	(1.02)	0.92	(1.06)	–2.24	(1.73)
University	0.86**	(0.23)	–0.089	(0.15)	–5.58**	(1.13)	–5.25**	(1.37)	–2.07	(2.04)
Unknown	–0.83**	(0.24)	0.038	(0.092)	–1.72*	(0.87)	–2.60*	(1.15)	0.29	(1.59)
Ethnicity										
Antilles, Aruba	–0.73*	(0.37)	0.080	(0.17)	3.16*	(1.59)	1.14	(1.84)	2.24	(2.30)
Morocco	–0.70**	(0.16)	–0.36**	(0.12)	–0.93*	(0.52)	–1.19*	(0.62)	–1.26	(0.87)
Surinam	0.28	(0.20)	0.50**	(0.091)	–1.59*	(0.69)	–1.68*	(0.85)	–1.76*	(1.04)
Turkey	0.59**	(0.13)	–0.30**	(0.074)	0.55	(0.58)	0.99	(0.71)	0.95	(0.90)
Other	0.26	(0.16)	–0.093	(0.067)	–2.07*	(0.69)	–1.24	(0.85)	0.17	(1.64)
Constant	–2.24**	(0.42)	0.27	(0.20)	–2.82*	(1.43)	–6.54**	(1.61)	–2.32	(3.17)
R-squared	0.11		0.21		0.18		0.16		0.47	
Monthly office observations	1494		1494		1485		1490		750	

Standard errors between parentheses; ** and * denote significance at the level of 1% and 10%, respectively.

Table 4.2 shows the estimation results for the performance outcomes that are not (directly) linked to outflow. With respect to the timeliness scores and the prevention quotes, and similar to the outflow rates, we only find the worker/client ratio to have an impact for the sub-sample of UI recipients. Again this seems to mirror the primary sphere of activity of PES offices, which is directed to short term unemployed clients predominantly receiving UI benefits. More specifically, we find a 1% increase in the worker/client ratio to increase the timeliness score of UI benefits with 0.015% and the UI prevention quote with 0.067%. Thus, we conclude that additional workers per office improve the administration of UI benefits and increase the strictness of the UI benefits eligibility process. But again, it should be noted that these effects are only small.

The size of the elasticities for most of the performance outcome measures contrasts to the estimated coefficient relating the worker/client ratio to the vacancy coverage in PES regions. Here, we find an elasticity that is close to one, suggesting that additional PES workers are well capable of attracting and registering vacancies. Stated differently, the coverage of vacancies that are being registered is predominantly determined by the number of PES workers per client, rather than exogenous characteristics. An interesting question here relates to the presence of deadweight effects. The registered vacancies may already have been posted by employers using other search channels, for instance private intermediaries. Thus, PES offices may register a higher share of vacancies in markets, but with the total number of vacancies in local markets remaining equal. Suppose for instance that the number of PES workers per client increases with 10%, then the model predicts an increase in the average vacancy coverage rate from 36.3 to 36.6%. At the one extreme, this increase would only consist of additional vacancies, yielding an elasticity vis-à-vis the *total* number of vacancies of 0.44. At the other extreme, there would only be substitution effects, with an elasticity estimate of zero.

We tested for the importance of substitution and net vacancy effects by re-estimating equation (1), now with the log value of the total number of vacancies as the variable to be explained. We then find a coefficient estimate of 0.088 (0.036), indicating that about 20% of the registered vacancies can be characterised as additional vacancies. As we have estimated the share coefficient of vacancy parameter in the overall outflow equation to be equal to 0.13, we thus infer that at 1% of PES workers causes the number of vacancies to rise by 0.088%, which in turn increases the outflow rate by 0.011%.

4.2 Robustness checks

Our estimation strategy strongly relies upon the assumption that the unemployment-vacancy (UV) measure is proper representative for local labour market conditions. In that case, the residual variation in worker/client ratios, both across PES offices and across time, can be considered as exogenous. Following this line of arguing, there are basically two issues that deserve attention: (i) the validity of the UV-measure we employ; and (ii) the between and within PES office variation in worker/client ratio's.

First, regarding the UV variable we use, one may argue that, as vacancies are measured with error, there may be attenuation biases that in turn contaminate the worker/client ratio coefficient. Typically, attenuation biases cause the impact of local labour market conditions to be underestimated. This means there will be unmeasured variation in local labour market conditions that is positively correlated with the worker-client ratio's, which in turn causes the effectiveness of additional workers per client to be overestimated. As a robustness check, we

therefore re-estimated the benchmark model for the outflow rates while setting the UV-coefficient equal to a value of 0.25, which is more in line with the literature (see Petrongolo and Pissarides, 2001). As we can see from Table 4.3, we generally find this specification to lower the worker/client ratio effectiveness, albeit the effects only small and insignificant. Thus, our results seem robust with respect to measurement errors in the number of vacancies.

A second way of testing the robustness of our model is by estimating model versions that only use variation of worker/client ratio's across time to estimate parameter coefficients. One model variant here is to include monthly calendar time dummies. In such as setting, variation in worker/client ratio's that result from generic time trends ─ in 2004 the average ratio increased by 3.8% ─ is no longer used to identify the effectiveness of additional workers. Table 4.3 shows that this does not alter our results substantially and significantly. We can also exploit the panel aspect of the data more rigorously by performing Fixed Effects (FE) estimation, with PES offices as relevant units. The table makes apparent that this specification yields results that do differ substantially for the GLS estimates. In particular, for almost all performance outcome measures we find lower and insignificant results; for the overall outflow rate there is even weak evidence for additional workers to reduce outflow outcomes. The obvious explanation for these results is that the time span that is covered by the data (only 2004) is too short to uncover the relation between changes in worker/client rates and changes in performance. It takes substantial time delays before additional workers are sufficiently trained in their counselling, monitoring and administration activities. Therefore, the FE results can be labelled as measures for short term effectiveness.

Table 4.3 Testing the robustness of worker/client effectiveness elasticities

	Benchmark model		**UV parameter fixed at 0.25**		**With calendar time dummies**		**Fixed Effects (FE) estimates**	
Outflow								
overall	0.041**	(0.012)	0.031**	(0.013)	0.041**	(0.011)	─0.024*	(0.014)
short term unemp.	0.025*	(0.013)	0.021	(0.014)	0.020	(0.013)	─0.006	(0.017)
long term unemp.	0.004	(0.019)	0.012	(0.019)	0.003	(0.018)	0.005	(0.023)
UI recipients	0.025**	(0.008)	0.021**	(0.008)	0.022**	(0.008)	0.009*	(0.004)
SA recipients	0.017	(0.012)	0.010	(0.013)	0.011	(0.011)	0.011	(0.008)
Timeliness								
UI recipients	0.015**	(0.005)			0.014**	(0.004)	─0.002	(0.006)
SA recipients	─0.000	(0.003)			─0.000	(0.002)	─ 0.000	(0.004)
Prevention quote								
UI claimants	0.067**	(0.016)			0.048**	(0.008)	─0.021	(0.029)
SA claimants	0.029	(0.018)			0.007	(0.008)	─0.019	(0.035)

Standard errors between parentheses. ** and * denote significance at the level of 1% and 10%, respectively.

4.3 Cost-effectiveness

When discussing the estimation results of the benchmark model, the picture that emerges is that PES offices do make a difference, but that the absolute impact is only small. Still, for a more complete assessment of this result, it is instructive to relate benefit savings to the costs of PES activities. For this purpose, we first calculate the effectiveness ─ i.e. the reduction of benefits ─ that is needed to just compensate worker costs of additional PES workers. From CWI (2005b), we estimate the yearly costs of an additional PES worker as approximately 97,200 euros, whereas for the average benefit level we come to an estimate of 16,400 euros per year (CBS, 2005).[13] Now, we increase the number of PES workers by 1%, which corresponds to almost 40 full time equivalents. In order to compensate for the additional workers costs, the number of clients that returns to work should increase with 234 benefit recipients. This corresponds to 0.037% of the stock of unemployed. We refer to this as the break-even-effectiveness.

Additional workers PES offices may lower the stock of unemployed clients by increasing outflow rates on the one hand, and by decreasing the inflow of clients (i.e. higher prevention quotes) on the other hand. When assuming a steady state environment, these two effects ─ that is, (small) relative decreases in the inflow rate and (small) relative increases in the outflow rate ─ are additive. According to our estimates the elasticity coefficient of the impact of additional PES workers on the overall outflow rate is 0.041, which slightly exceeds the break-even elasticity of 0.037. From this, we may already conclude that additional PES workers are cost-effective. Next, the effect on the inflow rate that results from a higher prevention quote amounts to 0.015.[14] Thus, the elasticity of the total (steady state) stock of clients vis-à-vis the worker/client ratio is estimated as 0.056, and the estimated ratio of benefit savings and worker costs equals 1.4.[15]

[13] We calculate the costs per worker as the total yearly costs of the PES (384 million euros), divided by the number of workers in 2004 (3950 full time equivalents). The average benefit level is obtained by adding the UI and SA benefit expenses in 2004 (10.1 billion euros), divided by the number of UI and SA recipients in that year (617,000).

[14] In order to calculate this effect, the impact on the prevention quotes of UI and SA recipients (0.067% and 0.029%, respectively) have to be scaled according to the inflow rate (which equals 1 minus the prevention quote). Next, we weigh the relative impacts on the UI and SA inflow rates by the number of benefit recipients in both schemes.

[15] Here, benefit savings are expressed as 0.056% of total expenses, whereas costs are 0.041% of total expenses. Thus, the ratio between the two is 1.4.

5 Conclusions

In the literature, the effectiveness of PES offices is primarily focussed on return-to-work rates of unemployed clients. This means that the scope of activities of PES workers is directed to job counselling and monitoring activities, rather than activities relating to the administration of benefits and the intake of new clients. Moreover, empirical evaluation studies usually take the perspective of specific instruments, leaving the role and sphere of activity of the PES unaddressed. This paper, however, takes a broader perspective ─ that is, it takes individual PES offices as the relevant unit of analysis, and measures performance of these offices along a variety of outcome measures. These performance measures include various outflow rates, timeliness measures of benefits, 'prevention quotes' and 'vacancy coverage'. When estimating the impact on these performance measures, we take advantage of characteristics of the budgeting formula that is used for local PES offices. Under the assumption that under- or overestimates of the number of full time worker equivalents are erroneous (but potentially persistent), we argue that the inclusion of proper controls for labour market tightness is sufficient to obtain consistent estimates of the effectiveness of PES workers.

Our estimation results on the effectiveness of additional workers mirror the sphere of activities that the PES offices primarily bear the responsibility for ─ that is, the intake, benefit administration, and counselling and monitoring activities for short term unemployed workers. First, we find a higher worker/client ratio at offices to increase the outflow rates for short term unemployed, which prevent this category from being long term unemployed. Second, we find a higher worker/client ratio to increase the timeliness of UI benefits, but not for SA benefits. This reflects the fact that UI recipients are overrepresented in the sub-sample of short term unemployed. Third, we find the prevention quotes of only UI applications to increase with respect to the number of workers per client, indicating that the additional working time is used to tighten the eligibility criteria ("Work First"). Finally, our results suggest that PES workers are quite effective in attracting and registering vacancies. These, however, mostly concern vacancies already being posted by employers.

Generally, the effects of additional workers per client on the various performance outcomes are only modest in absolute terms ─ local labour market conditions are much more important in determining local outflow rates. When supposing for instance that the worker/client ratio's for all offices are increased by 1%, this would increase the overall monthly outflow rate only by 0.041%. When comparing the effects on benefit expenses with the costs of additional workers, however, the picture that emerges is that PES offices are cost-effective. Under the assumption that we have as steady state value of the stock of PES clients, we find a 1% increase in the worker/client ratio to decrease the total UI and SA benefit costs with 0.056%, whereas an

increase of 0.037% would be needed to compensate for the accompanying worker costs. This implies a benefit/costs ratio of about 1.4.

According to our knowledge, the analysis presented in this paper is one of the first that takes a broad perspective on the activities of the PES. Still, for a full cost and benefit analysis of PES activities, we need more information on the specific ways the PES offices allocate their worker to the relevant activities. In the current setting, cost-efficiency is measured by comparing the allocation of PES workers with the alternative being that these workers are not allocated at all. Ideally, we would like to measure the relative efficiency of various activities as well. Similarly, our analysis would be enriched by using data for a longer time interval, so as to check for any relation between the business cycle and the (net-) effectiveness of the PES. We leave these issues for future research.

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