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Labour Market Institutions and Unemployment Revisited

by

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Abstract

In this paper the effects of institutional variables on unemployment are reinvestigated for nine OECD countries. The used framework allow for country specific estimates. In this case, the impact of the considered institutional variables on unemployment may differ across countries, not only in absolute terms but also in terms of sign. The main results are the following: First, there are remarkable differences across countries with respect to the estimated effects. Most of the considered variables have at least in one of the considered countries an unexpected effect. Secondly, after a careful examination of the results we identify complex interdependencies between the institutional variables, which bear resemblance to the interaction hypothesis. Thirdly, the estimates with respect to the minimum wage do confirm the theory of monopsonistic labour markets. Fourthly, based on a cross country comparison some evidence is found that some of the considered labour market institutions have a hump-shaped or U-shaped relation to the unemployment rate. All things considered, the results make strong distinctions clear, and the different economies should be extremely cautious to make a copy of the level of a certain labour market institution of the neighbours.

Keywords: Beveridge-Curve, employment determination, labour market rigidities, social security

JEL classification: J 60, E24, J50, H55

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1. Introduction

In recent years, a remarkable discussion has taken place on the question of how labour market institutions and unemployment are associated. Generally speaking, a consensus that labour market institutions have an effect on unemployment exists. However, with respect to the sign of the effect it seems that specific variables do not match this view.[1] Furthermore, these variables differ across countries. This paper will shed more light on that point. The mainstream macro-econometric approach in this field of research is to apply panel data models, because of data availability, consideration of unobserved heterogeneity and/or multicollinearity. However, the application of this method in this context has been criticised lately. *"Cross-country studies that relate unemployment rates to labour market institutions have limitations in the sense that institutions do not change frequently, and cross-sectional variation only is insufficient to catch the true effect of institutions."*[2]

However, it should be mentioned that cross-country studies do come to important conclusions. Blanchard and Wolfers (2000) find out that the duration of macroeconomic shocks increases with labour market institutions. Belot and van Ours (2000) find significant interactions between institutional variables. Nickell et al. (2002) have shown that it is helpful to use the Beveridge-Curve to analyse the effects of institutional variables on unemployment. Finally, Nickell et al. (2005) come to the conclusion that interactions between institutions and shocks make no significant contribution to the different experiences with unemployment.

In this paper the effects of institutional variables on unemployment are reinvestigated for nine OECD countries. In contrast to existing papers the used framework allow for country specific specifications and endogenous institutional variables. The possible endogeneity of the institutional variables will be controlled by using an Instrumental Variable estimator. The impact of the considered institutional variables on unemployment may differ across countries, not only in absolute terms, but also in terms of sign. Due to the fact that the institutional variables vary fractionally over time, they are plagued with multicollinearity. For this purpose an estimation strategy is developed to cope with this problem. The used framework allows each of the different variables to have two effects; a direct effect on unemployment, and an indirect effect via vacant jobs. Among other things the results allow for analysis, if the relationship between labour market institutions and unemployment is non-linear. In addition to the institutional

[1] For a detailed discussion with respect to the results of the latest research see, for example, the *Journal for Institutional Comparisons* (Vol. 1(2), summer 2003).

[2] Belot and Van Ours (2003), p. 3.

variables, thought has been given to several macroeconomic variables to get more reliable estimates.

The main results are the following: First, there are remarkable differences across countries with respect to the estimated effects. Most of the considered variables have at least in one of the considered countries an unexpected effect. Secondly, after a careful examination of the results we identify complex interdependencies between the institutional variables which bear resemblance to the interaction hypothesis (e.g. Nickell and Layard (1999)). Thirdly, the estimates with respect to the minimum wage do confirm the theory of monopsonistic labour markets (Manning (2003). Fourthly, based on a cross country comparison some evidence is found that some of the considered labour market institutions have a hump-shaped or U-shaped relation to the unemployment rate. With respect to the U-shaped relations this means that a reduction of the benefit replacement rate to zero or the abolition of trade unions would not lead to full employment.All things considered, the assumption of individual labour markets is noticeably confirmed, which accentuate the need for country specific estimates. For Germany for example, the estimated effect of the replacement rate on unemployment is positive, but for benefit duration on unemployment negative. That is, a reduction in both is counterproductive.

The paper is organized as follows. Section 2 describes the model as well as the data and section 3 the estimation strategy. Section 4 reports the estimation results and discusses their implications. Section 5 concludes.

2. Methodology and Data

2.1 The Model

The model is based on the Beveridge-Curve. From an empirical point of view, the coexistence of unemployment and vacancies is undisputed. It has been observed that unemployment decreases if vacancies increase and vice versa. This trade-off is depicted in figure 1.

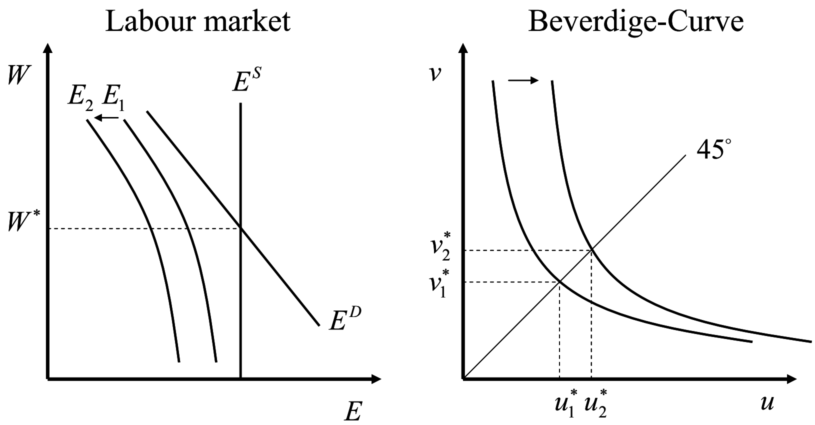

Figure 1: Labour market and Beveridge-Curve

In the labour market part of the picture, labour supply (E^S), for simplicity, is wage inelastic and labour demand (E^D) is downward sloping. This simple and well known model does not allow the phenomenon of mismatch, since only unemployment (for $W > W^*$) or vacancies (for $W < W^*$) exist on the labour market. To admit both, a third curve is required which is called here effective employment (E). For each W^* it follows, that the distance between the equilibrium point and the effective employment curve equals the equilibrium rate of unemployment and vacancies of the Beveridge-Curve[3]. If the Beveridge-Curve does not lie on the axes of v or u, it is clear that E exists for any given equilibrium on the labour market with a certain level of unemployment. If the matching efficiency decreases due to a change in the flexibility of labour market institutions, the effective employment curve shifts to the left, like in figure 1, and the Beveridge-Curve moves to the right.

The fundamental idea is that labour market institutions affect both unemployment and vacancies. In the first case, they influence directly the matching efficiency. In the latter case we have two indirect effects. First; if firms change their hiring policies with respect to the number of vacant jobs, the matching efficiency does not change since this causes a movement along the Beveridge-Curve. Secondly; if, on the other hand, it takes a longer (shorter) period to fill a vacant job, this in turn affects the matching efficiency. In this case the new point of intersection of unemployment and vacancies lies on a new curve.

The approach is to catch the direct and indirect effect separately. The institutional variables (**X**) affect both, unemployment (**u**) and vacancy (**v**) rates, whereas the latter has also an effect on unemployment:

$$\mathbf{u} = \alpha + \mathbf{v}\beta + \mathbf{X}\boldsymbol{\gamma} \qquad (2.1)$$

$$\mathbf{v} = \delta + \mathbf{X}\boldsymbol{\lambda} \qquad (2.2)$$

The lower case letters **u** and **v** indicate logs of unemployment and vacancy rates. In general, with respect to the considered variables an increasing effect of institutional variables on unemployment (positive gamma coefficients) is expected, as well as a decreasing effect of institutional variables on vacancies (negative lambda coefficients). The theory behind the effects of the respective institutional variables on unemployment and vacancies will be discussed in the next section.

[3] Dow and Dicks-Mireaux (1958) called this relationship Beveridge-Curve, since the idea goes back to Beveridge (1944). For a detailed discussion see, for example, Blanchard and Diamond (1989), Bleakley and Fuhrer (1997), Fuentes (2002), and Pissarides (2000).

2.2 Considered Variables

The right-hand side institutional variables are benefit duration (BD), benefit replacement ratio (RR), housing (HO), net union density (UD), tax wedge (TW), and the ratio of minimum to median wage (WR). In respect of the direct effect on unemployment the following considerations are discussed in the literature.[4]

The expected signs of the variables for the shift of the Beveridge-Curve are not clear-cut. A higher BD may shift the Beveridge-Curve to the right, because the wage earners choose a longer search period. But this might induce the opposite effect just as well. An extended search period may lead to a decreasing quit rate due to a better matching efficiency. The latter will lead to a shift of the Beveridge-Curve to the left.

A higher RR may shift the Beveridge-Curve to the right, because the wage earners with the lower wages choose a higher reservation wage. However, combined with a shorter BD this may result in a reduced search period (as is the case in the Nordic countries). The latter effect shifts the Beveridge-Curve to the left. If HO increases, the mobility of the wage earners will decrease and the matching efficiency will decrease too. UD may have two opposite effects on the Beveridge-Curve. First, a higher UD can raise wages via the bargaining process and make firms chary with respect to hiring. Secondly, a higher UD can stabilise employment at the firm level due to a reduction in fluctuations of wages. The first effect shifts the Beveridge-Curve to the right and the latter to the left.

If the TW increases, the real consumption wage will decrease and the Beveridge-Curve will shift to the right. Wage earners try to negotiate higher wages and because of the relative rise of the reservation wage, part of the wage earners with the lower wages choose voluntary unemployment. If the WR rises due to a higher minimum wage, the wage earners with the lower wages will drop out of voluntary unemployment due to the fact that the relative replacement rate decreases. On the other hand, this may lead to layoffs in the labour market segment of the wage earners with the lower wages. A third explanation based on the theory of a monopsonistic labour market. In this framework it is argued, that an increasing minimum wage could lead to increasing employment and decreasing unemployment respectively. At a certain minimum wage level the effects reverse. A fourth explanation based on the matching model with search effort. If the minimum wage is comparatively low, unemployment decreases with an increasing minimum wage. Again, the over-all effect on the Beveridge-Curve is not clear-cut.

[4] For a more detailed discussion of the interaction between institutional variables and unemployment see, for example, Nickell et al. (2002) and Cahuc and Zylberberg (2004).

In terms of indirect effects of institutional variables on unemployment via vacant jobs the following aspects shall be accentuated. It is a matter of common knowledge that job creation is higher in the USA than in Europe, and it is also well-known that labour market institutions are more distinct in Europe than in the USA. Thus, more flexible labour market institutions may lead to a rise in job creation and vacancies in Europe. Reductions in BD, RR, and HO could act as signals for firms in two ways. First, the labour force takes more fright at layoffs. Secondly, the applicants for a vacant job are more committed. The first effect may lead via a higher productivity to a rise in job creation and the latter effect may increase job creation too. The reason is that firms interpret these effects as an increased competitiveness of domestic labour force.

A decline in UD and TW is leading to a reduction of labour costs. If trade unions lose bargaining power, firms expect moderate wage increases and lower firing costs. Since TW incorporates none-wage labour costs, they decline if TW declines. At last, a rise in WR, on the basis of an increasing minimum wage, results in a decreasing job creation in the low wage segment of the labour market. Again, firms interpret these effects as decreased competitiveness of domestic labour force, which may increase the export of jobs. However, in the monopsony model and some matching models (with endogenous participation rate or search effort) the vacancies rate could increase with the minimum wage. All theses specified effects can be reinforced or alleviated by a change in the matching efficiency which has a direct effect on the vacancy rate via the duration of staffing.

To get more reliable estimates, thought has been given to several macroeconomic variables. These variables are labour costs (LC), trend labour productivity (LP), deviations from the trend of the total factor productivity (TFP), real interest rate (RIR), terms of trade shocks (TTS), and labour force participation (LFP). The expected direct effects of the macro variables on unemployment are the following.

If LC increase, the Beveridge-Curve shifts to the right. A rise in LP may have two effects. First, if LP grows faster than GDP, unemployment increases and the Beveridge-Curve shifts to the right. Secondly, if the increase in LP is relatively higher than the increase of the productivity of other factor inputs, the demand for labour will increase and the Beveridge-Curve will shift to the left.

The effect of TFP on the Beveridge-Curve is expected to be equivalent to the first and second supposition for LP. While LP is a trend variable, TFP is a deviation from the trend. This variable is added to control for the possibility that firms pay more attention to deviations of a trend than of the trend itself. A higher RIR will shift the Beveridge-Curve to the right because of negative effects on economic growth. TTS may induce different effects on the Beveridge-Curve. First; a rise in import prices may shift the Beveridge-Curve to the left, due to a substitution of imported goods. Secondly, higher import prices may lead to higher wages via the bargaining process and result in a shift of the Beveridge-Curve to the right. And lastly, an increase in the LFP shifts the Beveridge-Curve to the right.

With respect to the indirect effect on unemployment the following aspects are of relevance. If the LC rise, firms may decide to reduce vacancies. The effects of LP and TFP are ambiguous. On the one hand, firms will increase the vacancies if LP or TFP increases. On the other hand, if economic growth is too meagre, this may lead to a decreasing vacancy rate. A rise in RIR leads to a decrease in vacancies.

Again, TTS may induce different effects. First, a rise in import prices may lead to a rise in the vacancy rate due to a substitution of imported goods. Secondly, higher import prices may lead via higher wages to a decreasing vacancy rate.[5] LFP is unaccounted for in this equation. For the indirect effects of macroeconomic variables applies analogously that all effects can be reinforced or alleviated by a change in the matching efficiency.

The variables are taken from the *labour market institutions database 2.0* (Nickel and Nunziata (2002)). Exceptions are WR and LFP, which are taken from the online OECD labour force statistics. See appendix A on how these variables are generated. The maximum rage is from 1960 to 1995. For later dates not all variables are available. The considered countries are Austria, Canada, Denmark, France, Germany, Netherlands, Sweden, UK, and the USA.

3. Estimation Strategy

In contrast to existing papers on this theme the data for the considered countries should be estimated in separate equations, in place of a panel model. The country specific interactions between the institutional variables and unemployment and vacancies, respectively, are of prominent interest. Of course, country specific effects are possible with panel estimation likewise. But what are the advantages of panel estimates when there are no cross country effects, except possible time effects and a few more degrees of freedom? Furthermore, the country specific estimates eliminate the advantage of fixed effects, and random effects do not seem to be appropriate in this case.

[5] A third effect is an increase in the oil price. In this case the vacancy rate is expected to decrease, too.

A second point concerns the possible endogeneity of institutional variables. If the actual unemployment is high, it is possible that a certain institutional variable will be adjusted to the altered circumstances. In the sixties and seventies the reverse was also true. This applies to the effect of a change in the macro variables as well.[6] Panel Instrumental Variable (IV) estimation allow merely the same set of instruments for each country. In this case it is not possible to account for country specific weak and/or endogenous instruments.

A third point is multicollinearity. Of course, panel estimation reduces this problem. On the other hand, again, it is a country specific issue, if we take country specific estimates into account. Some of the variables could suffer from multicollinearity in one country but not in the others. This affects the specification of the model and the considered instruments.

To account for all the points an approach has to be developed, that allows for

- country specific coefficients,
- IV estimates with country specific valid instruments,
- reliable estimates in the presents of substantial multicollinearity.

To account for economic effects, the macroeconomic variables (**Z**) described above are incorporated in the equations as well. In consideration of the residuals ($\boldsymbol{\varepsilon}$) the equations have the following form:

$$\mathbf{u} = \alpha + \mathbf{v}\beta + \mathbf{X}\boldsymbol{\gamma} + \mathbf{Z}\boldsymbol{\varphi} + \boldsymbol{\varepsilon}_1 \quad (3.1)$$

$$\mathbf{v} = \delta + \mathbf{X}\boldsymbol{\lambda} + \mathbf{Z}\boldsymbol{\theta} + \boldsymbol{\varepsilon}_2 \quad (3.2)$$

In the rough, the two equations could be estimated simultaneously. Unfortunately, due to the substantial problem with multicollinearity this is not possible.[7] Both equations will be estimated for each country by Two Stage Least Squares with lagged explanatory variables as instruments. To account for the possible endogeneity of the variables and the substantial problem of multicollinearity the following estimation strategy has been chosen.

Starting from the correlation matrix of the **X** and **Z** variables, a combination of variables are chosen that have a correlation coefficient lower than 0.8. This procedure allows for estimate the same variable in different constitutions of variables, that is, in different subsets.[8] On average, this compensates the omitted variable bias that results theoretically from incomplete

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[6] It is also possible that institutional variables affect macroeconomic variables. See on this point, for example, Nunziata (2004).

[7] The main reason for the extensive multicollinearity is that the institutional variables do not change much over time.

[8] Let's assume we have the exogenous variables *a*, *b*, *c*, *d*, and *e*. In addition we assume, *a* and *b* as well as *d* and *e* suffer from high multicollinearity. Instead to estimate the variables in a joint equation, four equations with different subsets will be estimated: *acd*, *ace*, *bcd*, and *bce*.

specification. Needless to say, this bias does not exist, if we use valid instruments. That is the instruments are exogenous and relevant. It should be noticed that disregarded multicollinearity lead to increased standard errors and unbiased estimators on average. However, the specific parameters could change their sign, if worse comes to worst. In this case, the general effect of a specific variable is unreliable. The described strategy ensures that the sign of the respective variables is identified correctly.[9] It is possible that the sign of the estimated parameters differs in comparison to the simple correlation coefficients. This is a potential reason why some of the conclusions differ from those of Nickell (2003), who focus on the bivariate correlation.

In the next step the instruments of each assortment are chosen in a manner that each set of instruments is uncorrelated with the error term of the second stage. In the second stage all insignificant variables will be taken out. In the last step the finally chosen specification will be accepted or rejected (if the remaining instruments are endogenous). This estimation strategy allows country specific unbiased estimates exempt from multicollinearity.

The main concern should be the sign of the respective variables, that is, the country specific differences of the fundamental impact of institutional variables. There are various reasons why we should take the size of the coefficients with a pinch of salt. Firstly; up to now we know too little about the meaning of lagged effects, in case of institutional variables change (noticeable).[10] Secondly; there are further institutional events that are not taken into account, either due to data availability or due to low variability.[11] Thirdly; the cultural diversity across countries is not taken into account, but it seems to be plausible that it interacts with the institutions.[12] Fourthly, plain-spoken, we know at best a little bit about the functional form that captures the causality thorough. Fifthly, due to the fact that some of the institutional variables are highly correlated, we can not definitely distinguish between causality and correlation between unemployment and institutions.

4. Results

In principle, the results confirm the guess of fundamental differences between the countries in terms of the respective institutional variable. To make the discussion of the results clearly

[9] If, for example, the sign of one parameter differs from his remainder realisations, the equation concerned will be re-specified. In this case the change of the sign appears due to high multicollinearity in the first stage of the IV estimation.

[10] See on this Ljungqvist and Sargant (1998) and (2002).

[11] See, for example, Belot and Van Ours (2003).

[12] See Roland (2004) for a discussion of this point.

arranged, the average effects of each variable will be displayed in separate tables. Full results of the estimates as well as statistics are given in the appendix. Table 1 displays the average effect of each variable on the logarithm of the unemployment rate.

The Beveridge-Curve is confirmed for each country except France.[13] While BD has a negative effect on unemployment in Canada and the USA, RR has a negative effect in Germany and the UK. In the first case, the increased matching efficiency is the commanding effect. This could be an indication of a non-linearity, because BD is tersest in Canada and the USA.[14] That is, at a certain point the effect of this variable change the sign. In the second case, it may be possible that an increase in RR tends to result in a better match in Germany and the UK. In this case, the job seeker is looking for an acceptable contract, not for the first contract that is offered, and it will be argued that the latter contract has a shorter duration. The results for RR roughly fit into a U-shape, because RR is smallest in Germany and the UK.

Table 1: Average effects on log(u)

	Austria	Canada	Denmark	France	Germany	Nether-lands	Sweden	UK	USA
LOG(V)	*-0.09*	*-0.17*	*-0.15*	*0.25*	*-1.08*	*-0.34*	*-0.77*	*-0.87*	*-0.50*
BD	*0.53*	*-5.23*	*1.79*	*3.34*	*10.97*	*1.80*	*31.95*	*1.60*	*-4.49*
RR	*3.12*	*2.20*	*8.30*	*7.26*	*-17.77*	*6.74*	*3.63*	*-4.04*	*3.73*
HO	*5.00*	*22.57*	*48.59*	*13.30*	*8.25*	*12.40*	*20.82*	*4.64*	*15.43*
TW	*8.39*	*-4.95*	*9.88*	*11.63*	*9.34*	*10.40*	*-5.50*	*7.96*	*2.35*
UD	*-4.30*	*7.10*	*13.61*	*-12.89*	*-11.87*	*-6.35*	*6.46*	*5.15*	*-1.82*
WR	*na*	*-3.79*	*na*	*7.01*	*na*	*-22.10*	*na*	*na*	*-1.36*
LC	*0.55*	*2.46*	*4.86*	*1.30*	*1.12*	*4.32*	*-1.49*	*1.94*	*0.74*
LFP	*0.07*	*0.05*	*0.14*	*0.18*	*0.12*	◦	*-0.12*	*0.27*	*0.02*
LP	*1.44*	*1.90*	*4.70*	*1.51*	*1.58*	*3.76*	*-1.83*	*2.12*	*1.02*
RIR	*18.90*	*6.42*	*27.35*	*13.64*	*21.14*	*13.53*	*6.69*	*8.22*	*2.72*
TFP	*-8.18*	*-17.69*	*20.82*	*-17.46*	*11.01*	◦	*15.45*	*17.50*	*-23.90*
TTS	◦	*27.64*	*10.39*	*-16.27*	◦	*32.61*	*13.73*	*10.75*	*-22.94*

WR is available only for Canada, France, Netherlands, and the USA. ◦ means no statistical significant effect.

HO is the only institutional variable with an identical effect in terms of the sign across countries in principle. The negative effect of TW on unemployment in Canada and Sweden is surprisingly.[15] Theoretical models conclude that more progressive taxes reduce unemployment.[16]

[13] This finding is to be concordant with results based on another Beveridge-Curve specification in Ochsen (2004).

[14] BD is very short in Sweden, too, but RR is noticeable higher in Sweden than in Canada and the USA. This is, in turn, an indication of an interaction effect between BD and RR.

[15] With respect to Sweden most of the results are less reliable, since in most of the regressions we have not enough observations.

[16] See for example Cahuc and Zylberberg (2004).

This effect could dominate the negative effects of an increasing tax wedge. Holmlund and Kolm (1995) find some evidence in favour of this hypothesis for Sweden.

The results for UD display a mixed picture. As mentioned above, there are two effects that can be positive or negative overall. The more traditional view is ascertained for Canada, Denmark, Sweden and the UK. A negative effect of UD on unemployment is found for Austria, France, Germany, Netherlands and the USA. In this case it will be argued that a lower union density increases both fluctuations of wages at the firm level and the quit rate.

With respect to WR two effects are possible. Firstly; if the minimum wage changes (rises or falls) while the median wage remains constant, the expected sign could be positive as well as negative, as explained above. Secondly; if the median wage changes (rises or falls) while the minimum wage remains constant, the expected sign is negative. The more traditional view of a competitive labour market seems to be relevant only for France.[17] However, the monopsony model and the above mentioned matching models seam to be relevant for all the considered countries.[18]

Due to data availability the estimated effects of LC and LFP on unemployment for Sweden based upon the time span 1977 to 1995, which could be the reason for the estimated signs. With respect to LFP, particularly in the nineties, unemployment and LFP move in opposite directions. This could be an indication that LFP depends on employment opportunities. The negative impact of LP on unemployment in Sweden may be explained by a higher productivity performance of labour compared to other factors of production. That is, capital and intermediates substitute labour only on a small scale. This applies particularly for low skilled labour and is reinforced by the fact that low skilled unemployment is lower in Sweden than in all other considered countries.

A rise in the real interest rate leads to higher unemployment in all considered countries, as expected. The estimates for LP are somewhat unexpected, but explainable. LP is a trend variable as explained above. Since productivity increases permanently, it is positive correlated with any variable that increases at least for a longer period, as, for example, unemployment. Therefore, the deviation of the trend, as used for TFP, would lead to more accurate (and not spurious) estimates. The same argument is true for LC, which is constructed in a similar fashion (see appendix A for details). But in this case we received the expected sign. The only ex-

[17] Nickell and Layard (1999) argue with respect to France, that the high payroll tax and the not seriously adjusted minimum wage for the under 25s might have increased unemployment.

[18] Portugal and Cardoso (2001) received for Portugal results that are coherent with the prediction of the monopsony model.

ception with respect to the parameters for LP and LC is Sweden, which has very stable and low unemployment rates for three decades. From this it follows that we cannot rely on the estimated effects of LP and LC, if we use the level of the variables instead of the deviations from the trend, as in the case of TFP.

A fall in TFP is expected to increase unemployment. For Denmark, Germany, Sweden and the UK we obtain the opposite result. In this case the productivity growth is faster than net job creation (or GDP). The results support the view that productivity growth is faster in Europe than in North America. With respect to TTS it appears that increased import prices reduce unemployment due to a substitution of domestic goods for imported goods in France and the USA. All the rest of the considered countries experienced a rising unemployment, except for Austria and Germany.

Table 2: Average effects on log(v)

	Austria	Canada	Denmark	France	Germany	Nether-lands	Sweden	UK	USA
BD	*-0.51*	*-3.95*	*3.52*	*-3.51*	*-15.02*	*-1.77*	*-5.84*	*-0.89*	*6.73*
RR	*-1.84*	*2.74*	*-7.97*	*8.66*	*21.24*	*-12.60*	*-0.59*	*1.65*	*3.66*
HO	*-2.33*	*26.62*	*-93.86*	*15.60*	*-13.39*	*-18.84*	*-5.29*	*-1.22*	*9.31*
TW	◦	*-5.56*	◦	*-29.93*	*-12.80*	*-6.65*	*-1.41*	*-2.54*	*3.85*
UD	*2.69*	*7.43*	*-11.73*	*6.61*	*-12.39*	*7.14*	*-7.67*	*-1.85*	*-1.17*
WR	*na*	*4.64*	*na*	*8.74*	*na*	*5.57*	*na*	*na*	*2.47*
LC	*-0.53*	*-2.29*	*-6.26*	*1.17*	*-1.22*	*-4.27*	*-1.14*	*-0.48*	*1.06*
LP	*-0.60*	*-2.83*	*-7.44*	*1.63*	*-1.46*	*-3.18*	*-0.95*	*-0.52*	*1.80*
RIR	*-12.80*	*-8.44*	*-31.74*	*-16.42*	*-32.87*	*-12.59*	*-9.41*	*-3.04*	*-5.24*
TFP	*12.55*	*23.76*	*27.10*	*30.17*	*33.91*	*22.81*	*30.39*	*12.93*	*20.85*
TTS	◦	*-22.47*	*-20.34*	*20.69*	*34.23*	◦	◦	◦	*27.26*

WR is available only for Canada, France, Netherlands, and the USA. ◦ means no statistical significant effect.

Table 2 displays the average effects of institutional and macroeconomic variables on the logarithm of the vacancy rate. With respect to BD and RR the positive effects on vacancies arise from a decreasing matching efficiency due to a longer search period and a relative rise of the reservation wage. At least one of the variables has a positive effect in Canada, Denmark, France, Germany and the UK. For the USA both variables have a positive impact. This can be explained by the fact that both BD and RR are comparatively low in the USA. A further reduction will have at most a little signalling effect with respect to an increased competitiveness of firms. The effect of a longer search period dominates the signalling effect.[19] Again, BD and RR appear to stand in a nonlinear relation to the dependent variable (vacancy rate).

HO has a positive effect on vacancies in North America and France (due to an extended search period), the countries with the highest housing rate. The labour force in these countries is more flexible with respect to selling and buying a house, than the labour force in the rest of Europe. In the latter the housing rate is lower and an increase leads to a decreased mobility. This suggests a U-shape relation to the vacancy rate.

TW has the expected negative impact, except for the USA. One possible explanation is that an increased TW increases the search period. That is, job seekers choose a longer search period to find employment with a comparatively higher wage. Or alternatively, they will not accept the first offer. Another explanation is the above mentioned progressive taxes argument, which applies especially to the low wage segment.[20] With respect to UD two explanations are possible for the positive effect. Firstly; a higher union density increases the vacancy rate, via reduced fluctuations of wages at the firm level. Secondly; the employers search more accurate if trade unions get more power, due to increasing firing costs.

An increased WR appears to increase the search period in all considered countries. The result of the competitive labour market theory seems not to be relevant. Two general explanations are possible: Firstly; if the median wage changes (rises or falls) while the minimum wage remains constant, the expected sign is positive. Secondly; both the monospony model and the above mentioned matching models are in accordance with the estimates.[21]

If we take a look on the effects of the macroeconomic variables on the vacancy rate we find much fewer different results. The expected effects with respect to the sign are estimated for most of the countries. Exceptions are France and the USA with respect to LC and all other countries with respect to LP. The problem with the level of the variables is the same here as in the unemployment equation. One explanation for France and the USA is a comparatively high growth rate of GDP. That applies for France in particular until the first oil crises and for the USA for the whole period to be considered.[22] A second explanation is a substantial structural

[19] Austria has, as well as Sweden, the lowest long run unemployment rate among the European countries. For both countries exclusively negative effects of BD and RR on the vacancy rate are estimated. This is surprisingly, to some extent, since these are the economies with the strongest long term labour market tightness.

[20] It seems to be possible that the increased wage (cost) pressure will be dominated, since the increase in the tax wedge is considerable lower in the USA than in all the other considered countries.

[21] In the matching model with endogenous participation rate both the vacancy rate and the unemployment rate increases. This is an explanation for France. In the matching model with search effort, the vacancy rate increases while the unemployment rate decreases, if the minimum wage is comparatively low. This model seems to be relevant for all considered countries.

[22] See for a comparison of GDP growth rates of different OECD countries, for example, Hein and Ochsen (2003).

change of the economy. If the manufacturing sector declines and the service sector increases, increasing vacancy rates on the one hand, and increasing LC on the other hand, could appear simultaneously. The positive effect of TTS, which appears in France, Germany and the USA, may result from a substitution of domestic goods for imported goods.

Nickel and Nunziata (2002) provide also data on collective bargaining coverage, coordination index and employment protection index. These variables are not considered for the estimates due to theirs low volatility. But we can draw some conclusions by comparing them with the results discussed above. Particularly, with regard to collective bargaining coverage and coordination, we can identify interactions with UD. If UD has negative effects on the unemployment rate, then collective bargaining coverage and coordination seam to have a positive effect, and vice versa. This interaction effect applies to the vacancy rate too, though, not always. That is, focussing on UD alone does not help to understand the relevance of trade unions in the discussion of unemployment and/or job creation and job destruction, respectively.

With respect to BD and RR unexpected signs are found for Canada (BD), Germany (RR), UK (RR), and the USA (BD). In any case the values of BD or RR are comparatively low. The employment protection index is very low and does not change in the North American countries and in the UK. The same economies have the lowest collective bargaining power and coordination. For Germany, on the other hand, employment protection as well as collective bargaining coverage and coordination are comparatively high. Due to the fact that we suppose interdependency between collective bargaining coverage and coordination with UD, the latter could also be interacted with BD, RR, and employment protection.

From this it follows the possibility that theses institutions could be linked to each other in complex interdependencies which bear resemblance to the interaction hypothesis (e.g. Nickell and Layard (1999)). Furthermore, theses institutions could have a hump-shaped (collective bargaining coverage, coordination index and employment protection index) and U-shaped (BD, RR and UD) effect, respectively, on unemployment. The latter is supported by the estimation results. That is, from two different points higher as well as lower flexibility could bring out the same negative or positive effect on the labour market performance.

Figure 2: Labour market institutions and unemployment

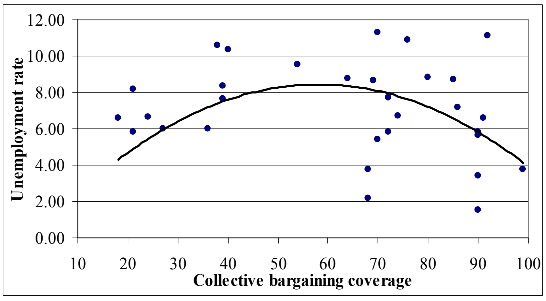

Figure 2a: Collective bargaining coverage and unemployment rate (%)

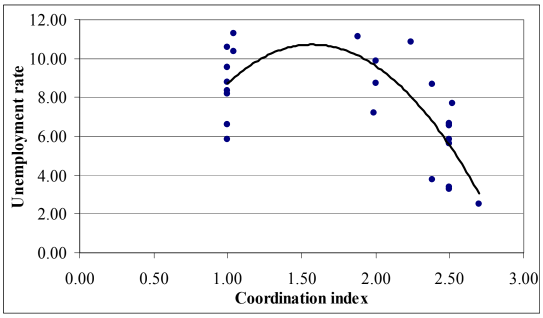

Figure 2b: Coordination index and unemployment rate (%)

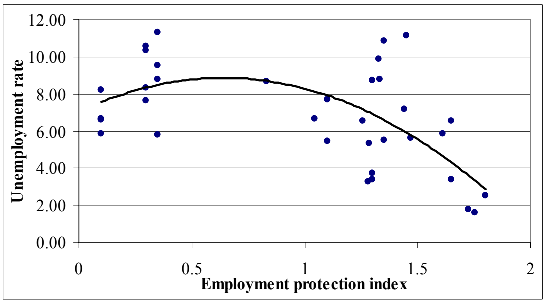

Figure 2c: Employment protection index and unemployment rate (%)

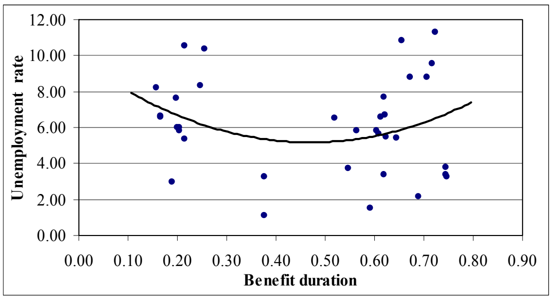

Figure 2d: Benefit duration and unemployment rate (%)

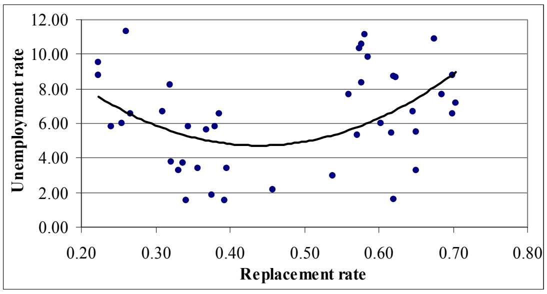

Figure 2e: Replacement rate and unemployment rate (%)

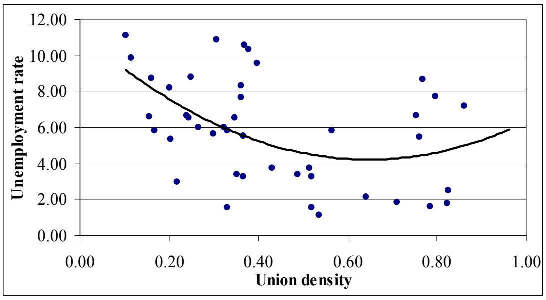

Figure 2f: Union density and unemployment rate (%)

This bears some similarity with the hump-shaped relation between the degree of centralization of bargaining and the unemployment rate (Calmfors and Driffill (1988)); and there are in fact similarities, as figure 2 displays. Each point in the six pictures contains an average value over five years of one of the considered countries between 1971 and 1995.[23] The quadratic trend line confirms the conclusion that the relationship between institutions and unemployment is not simply linear.

It attracts attention that Canada, the USA, and to some extent the UK have comparatively low values with respect to collective bargaining, coordination and employment protection. How-

[23] An exception is figure 2*b*. Here the range 1981 to 1995 is chosen, to get a clear figure. Extreme outliers are removed in the graphs. In figure 2*b* the curve for the Netherlands is temporarily at the right of the average curve. In some countries the curve is below the average curve in the beginning of the seventies in figure 2*c*. In Figure 2*d* the French curve is above and the Swedish curve is below the average curve. For the latter the same is temporarily true in figure 2*e*. In figure 2*f* the curve of UK is temporarily above the average curve. Data for collective bargaining are available only for 31 points.

ever, the experiences with unemployment are very different in these countries. Particularly, Canada has in the nineties a higher unemployment rate than most of the European countries. This can be partly explained with the different combinations of BD, RR and UD.

The non-linear curves in figure 2 are an average locus across countries and time. Each countries curve (could) have its own locus with possible country specific shifts. Hence, it does not make sense to identify the country specific optimum without knowing the corresponding curve. Beyond that, we have to take the effect on the vacancies into account. Therefore, each picture is helpful for a better understanding of the mechanisms between institutional variable and unemployment, but it does not help to give a reliable policy advice. For the latter is it more meaningful to consider the signs of the estimated effects in table 1 and 2.

5. Conclusions

The results emphasise the different experiences with labour market institutions. They point out that panel data models imply strong restrictions, maybe too strong ones in the context of the underlying theories. As we have seen, neither of the countries is like another with respect to the impact of the individual combined labour market institutions. However, some of the considered economies have more in common than others. A more efficient combination of the institutions can only be reached if we get a deeper understanding of the country specific interaction. It can definitely not be reached, if we simply copy a certain level of a certain labour market institution. This can be at best irrelevant and at worst misleading (Rodrik (2004)).

Regarding the macro variables there are no major differences in the country specific results, provided that Sweden is left out. The main difference between the considered countries concerns TFP and TTS. Most of the unexpected results are found for France and the USA. Surprisingly these two countries have the same differences in macroeconomic effects, compared to the rest of the considered countries.

This paper does not give an answer to all the questions in this field of research. As Freeman (1998, 2000) notes, if we compare institutions on the international level we find a variety of institutional systems and each one has its own rules. The natural next step in research is to understand the different systems and to figure out there strengths and weaknesses, though, in a more careful manner. The results of the estimates and there implications have at least clarified one important insight: All things considered, the results make strong distinctions clear and the different economies should be extremely cautious with respect to a transplantation of the level of a certain labour market institution of the neighbours.

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Appendix A

Data description

BD: Benefit Duration [0,1]

$$BD = \alpha \frac{RR_{2,3}}{RR_1} + (1-\alpha)\frac{RR_{4,5}}{RR_1} \quad \text{with } \alpha = 0.6$$

RR_1: Unemployment benefit replacement rate received during the first year of unemployment; $RR_{2,3}$: Unemployment benefit replacement rate received during the second and third year of unemployment; $RR_{4,5}$: Unemployment benefit replacement rate received during the fourth and fifth year of unemployment.

Source: Nickell and Nunziata (2002)

RR: Benefit Replacement Rates [0,1]

RR = percentage of average earnings before tax.

The data refers to first year of unemployment benefits, averages over family, since many countries benefits are distributed according to family composition.

Source: Nickell and Nunziata (2002) → OECD

HO: Housing (percentage owner occupied) [0,1]

HO = owner occupier households as percentage of total households

Source: Nickell and Nunziata (2002) → Oswald (1996) + unpublished update

TW: Tax Wedge [0,1]

$$TW = \underbrace{\frac{EC}{(IE + EC)}}_{\text{employment tax}} + \underbrace{\frac{DT}{HCR}}_{\text{direct tax}} + \underbrace{\frac{TX - SB}{CC}}_{\text{indirect tax}}$$

EC: Employers' total contributions; *IE*: Wage, salaries and social security contributions; *DT*: Amount of indirect tax; *HCR*: Amount of households' current receipts; *TX*: Total indirect taxes; *SB*: Subsidies; *CC*: Private final expenditures.

Source: Nickell and Nunziata (2002) → London School of Economics CEP-OECD Database

UD: Net Union Density [0,1]

$$UD = \frac{\text{total reported union members (gross minus retired and unemployed members)}}{\text{wage and salaried employees}}$$

Source: Nickell and Nunziata (2002)

WR: Wage Ratio

$$WR = \frac{W_{min}}{W_{med}}$$

W_{min}: Minimum wage; W_{med}: Median wage.

Source: OECD, Labour Market Statistics - Indicators

LC: Labour Costs

$$LC = \ln IE - \ln ET - \ln P_{GDP}$$

IE: Wage, salaries and social security contributions; *ET*: Total employment; P_{GDP}: GDP deflator at factor costs.

Source: Nickell and Nunziata (2002) → London School of Economics CEP-OECD Database

LFP: Labour Force Participation rate

$$LFP = \frac{E_{15-64}}{N_{15-64}}$$

E_{15-64}: Employed plus unemployed persons, age cohort 15 – 64; N_{15-64}: Population, age cohort 15 – 64.

Source: OECD, Labour Market Statistics - Indicators

LP: Trend Productivity of Labour

$$LP = H\left(\ln GDP - \ln ET\right)$$

H: Hodrick Presscott trend; *GDP*: Real GDP at 1990 prices; *ET*: Total Employment.

Source: Nickell and Nunziata (2002)

RIR: Real Interest Rate

Long term real interest rate, constructed using long term nominal interest rate and inflation.

Source: Nickell and Nunziata (2002) → OECD

TFP: Cyclical Component of Total Factor Productivity

$$TFP = SR - H$$

SR: Solow residual (Nickell and Nunziata (2000)); *H*: Hodrick Presscott trend.

Source: Nickell and Nunziata (2002)

TTS: Terms of Trade Shock

$$TTS = \frac{IM}{GDP} \Delta \ln \left(\frac{P_{IM}}{P_{GDP}} \right)$$

IM: Imports at current prices; *GDP*: GDP at current prices; P_{IM}: Import price deflator; P_{GDP}: GDP price deflator at market prices.

Source: Nickell and Nunziata (2002)

Table A1: Austria

LOG(U)

	1	2	3	4	5	6	7	*Average*
LOG(V)	-0.349	0.103	0.077	-0.140	-0.484	-0.172	0.318	*-0.092*
	-3.617	0.473	0.407	-1.606	-2.355	-1.376	1.208	
BD		0.533						*0.533*
		2.271						
BRR			3.117					*3.117*
			3.155					
HO				5.002				*5.002*
				12.392				
TW						8.388		*8.388*
						6.208		
UDNET					-4.300			*-4.300*
					-2.744			
WR								
LABC	0.553							*0.553*
	2.584							
LFP	0.086	0.054	0.063					*0.068*
	3.508	2.538	3.404					
PRODHP							1.438	*1.438*
							4.520	
RIRL	12.798	22.394	17.467	13.666	17.577	23.005	25.422	*18.904*
	4.783	6.720	4.769	7.158	3.037	7.006	5.133	
TFPHPC	-4.677	-10.163	-8.769	-5.192	-9.333		-10.918	*-8.175*
	-2.533	-2.490	-2.499	-2.679	-3.916		-2.909	
TTS								
adj. R2	0.922	0.823	0.845	0.94	0.777	0.827	0.808	
n	26	27	27	30	30	30	27	
range	1969-1994	1969-1995	1969-1995	1966-1995	1966-1995	1966-1995	1969-1995	
J-Stat.	0.088	1.248	0.019	0.244	1.133	1.705	0.115	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

LOG(V)		*	*	*		*	
BD	*	*					*
BRR	*				*		
HO				*	*		
TW						*	
UDNET			*	*	*	*	
WR							
LABC	*	*	*	*	*	*	
LFP	*	*	*				*
PRODHP							*
RIRL	*	*	*	*	*	*	*
TFPHPC	*	*	*	*		*	*
TTS							

All instruments are laged by one year

Table A2: Austria

LOG(V)

	1	2	3	4	5	6	*Average*
BD		-0.507					*-0.507*
		-3.761					
RR			-1.840				*-1.840*
			-3.195				
HO					-2.334		*-2.334*
					-2.311		
TW							
UD				2.691			*2.691*
				2.466			
LC	-0.527						*-0.527*
	-3.401						
LP						-0.598	*-0.598*
						-3.191	
RIR	-12.626	-14.741	-11.337			-12.506	*-12.802*
	-2.108	-2.120	-1.784			-2.006	
TFP	11.794	11.693	12.477	15.024	12.884	11.455	*12.554*
	1.945	1.824	2.063	1.996	1.965	1.780	
TTS							
adj. R2	0.572	0.585	0.577	0.193	0.292	0.550	
n	29	30	30	35	35	30	
range	1966-1994	1966-1995	1966-1995	1961-1995	1961-1995	1966-1995	
J-Stat.	na	na	0.052	2.418	2.241	na	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) l

Instruments

BD		*				
RR			*			
HO				*	*	
TW				*	*	
UD			*	*		
LC	*					
LFP						
LP						*
RIR	*	*	*			*
TFP	*	*	*	*	*	*
TTS						

All instruments are laged by one year

Table A3: Canada

LOG(U)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	*Average*
LOG(V)	-0.045	-0.428	-0.437	-0.552	-0.507	-0.530	-0.323	0.404	-0.187	1.005	-0.553	-0.689	-0.265	-0.025	-0.478	-0.288	0.685	0.170	*-0.169*
	-0.302	-7.504	-3.571	-6.172	-4.627	-5.078	-3.316	1.257	-2.142	2.794	-8.278	-5.594	-4.284	-0.173	-4.919	-3.536	2.332	0.736	
BD	-6.351		-4.031	-6.109								-4.066		-5.608					*-5.233*
	-7.924		-3.396	-6.082								-3.776		-13.464					
BRR					2.047	2.209	3.297	3.195	1.054		2.234		1.442		2.132	2.170			*2.198*
					2.295	2.250	6.707	4.168	2.917		3.618		3.285		2.556	3.688			
HO			29.793		17.676	32.502	18.786								14.073				*22.566*
			2.832		2.433	3.766	2.524								2.041				
TW	-3.028	-8.002		-4.592							-4.201	-5.940	-6.024	-2.838		-4.938			*-4.945*
	-3.434	-7.467		-4.305							-5.926	-5.826	-9.287	-3.180		-5.132			
UDNET									6.589									7.608	*7.099*
									6.385									5.806	
WR		-0.962	-2.677	-6.016				-5.509											*-3.791*
		-1.965	-2.595	-5.632				-4.360											
LABC		4.087			1.122					1.989			2.661						*2.465*
		9.253			1.926					3.778			6.824						
LFP						0.016					0.058	0.066							*0.047*
						2.340					15.053	5.251							
PRODHP															1.313	2.454	1.926		*1.897*
															2.189	3.566	3.755		
RIRL	11.331						3.430		2.311	8.945			4.158	11.425		3.784	7.292	5.131	*6.423*
	8.254						2.728		2.139	3.076			6.140	9.986		3.183	2.699	2.425	
TFPHPC								-18.673		-20.013							-14.377		*-17.687*
								-2.178		-2.726							-3.312		
TTS								31.744		34.795							30.191	13.818	*27.637*
								2.326		2.749							3.227	2.391	
adj. R2	0.776	0.393	0.645	0.705	0.811	0.723	0.798	0.209	0.939	0.022	0.898	0.797	0.933	0.755	0.829	0.938	0.503	0.792	
n	33	29	29	29	30	29	29	29	29	29	29	29	29	30	30	33	33	29	
range	1963-1995	1967-1995	1967-1995	1967-1995	1966-1995	1967-1995	1967-1995	1967-1995	1967-1995	1967-1995	1967-1995	1967-1995	1967-1995	1966-1995	1966-1995	1963-1995	1963-1995	1967-1995	
J-Stat.	0.863	5.814*	1.523	2.198	6.054	1.947	0.195	0.128	3.761	1.985	0.029	0.426	0.886	0.906	3.294	0.542	4.608	2.342	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
LOG(V)	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	
BD										*	*		*			*	*	*
BRR		*			*	*			*		*	*	*		*	*	*	*
HO	*			*	*		*		*	*			*	*	*	*	*	*
TW	*	*		*					*					*				*
UDNET	*		*	*		*		*		*	*	*	*	*		*	*	
WR		*	*	*	*	*	*	*	*					*	*			*
LABC		*	*	*		*	*	*	*	*	*	*	*					*
LFP	*		*					*									*	*
PRODHP																*		
RIRL				*	*								*			*		*
TFPHPC	*			*	*	*	*	*		*	*	*	*	*	*	*	*	
TTS		*	*		*	*				*	*				*		*	

All instruments are laged by one year

Table A4: Canada

LOG(V)

	1	2	3	4	5	6	7	8	9	10	*Average*
BD	-3.953										*-3.953*
	-3.582										
BRR				2.742							*2.742*
				4.997							
HO			19.819		29.260		19.350	30.787	33.889		*26.621*
			2.145		2.505		3.150	3.774	2.668		
TW	-5.032		-5.016	-6.634							*-5.561*
	-4.017		-3.852	-5.076							
UDNET		3.218				9.448				9.621	*7.429*
		3.208				2.099				1.920	
WR								4.642			*4.642*
								4.368			
LABC					-1.498	-3.083					*-2.290*
					-2.990	-2.577					
PRODHP									-1.908	-3.743	*-2.825*
									-3.201	-2.452	
RIRL		-10.103					-6.783				*-8.443*
		-7.659					-6.353				
TFPHPC			25.820		25.442	29.090	15.545	21.451	25.191		*23.756*
			5.185		5.801	7.213	5.033	5.268	5.738	26.556	
TTS	-28.068	-31.760					-25.585	-33.477		6.537	*-22.471*
	-2.079	-2.479					-2.926	-3.003			
adj. R2	0.028	0.074	0.305	0.215	0.238	0.189	0.553	0.296	0.388	0.284	
n	29	30	29	29	29	30	29	29	29	30	
range	1967-1995	1966-1995	1967-1995	1967-1995	1967-1995	1966-1995	1967-1995	1967-1995	1967-1995	1966-1995	
J-Stat.	4.198	1.124	1.820	0.695	2.094	0.368	1.632	0.133	1.222	1.438	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10
BD	*	*		*	*		*		*	
BRR		*		*	*	*		*	*	*
HO		*	*	*	*	*	*	*	*	*
TW	*	*		*						
UDNET	*					*	*	*		*
WR	*	*				*	*	*		*
LABC	*		*	*	*		*	*	*	
LFP										
PRODHP										
RIRL	*	*	*							
TFPHPC			*		*	*	*	*	*	*
TTS							*			

All instruments are laged by one year

Table A5: Denmark

LOG(U)

	1	2	3	4	5	6	7	8	9	10	11	12	13	*Average*
LOG(V)	-0.154	-0.458	-0.201	0.176	-0.312	0.133	-0.480	-0.399	-0.681	0.316	0.840	-0.293	-0.387	*-0.146*
	-1.206	-2.290	-1.414	1.811	-4.314	0.719	-4.502	-4.838	-3.658	1.460	1.947	-3.499	-4.208	
BD	1.382	1.992	1.401				2.322		1.863					*1.792*
	4.571	3.243	2.892				2.014		2.239					
BRR	6.326									10.280				*8.303*
	3.346									4.706				
HO			48.588											*48.588*
			1.759											
TW									8.843		11.105	9.683		*9.877*
									2.017		1.948	5.759		
UDNET				13.614										*13.614*
				6.492										
LABC					4.567							5.157		*4.862*
					5.128							2.128		
LFP			0.081			0.182	0.144							*0.136*
			2.009			3.417	2.690							
PRODHP								4.314					5.085	*4.700*
								4.361					4.917	
RIRL		11.811				18.329					51.900			*27.346*
		2.130				2.040					3.616			
TFPHPC						26.010	15.982			20.460				*20.817*
						4.356	1.923			1.929				
TTS													10.393	*10.393*
													2.075	
adj. R2	0.783	0.521	0.756	0.786	0.797	0.174	0.638	0.749	0.558	0.483	-1.152	0.722	0.658	
n	25	25	25	25	25	25	25	25	26	25	26	25	25	
range	1971-1995	1971-1995	1971-1995	1971-1995	1971-1995	1971-1995	1971-1995	1971-1995	1970-1995	1971-1995	1970-1995	1971-1995	1971-1995	
J-Stat.	2.058	3.817	3.556	0.651	1.159	1.687	0.005	1.306	0.121	0.496	0.011	2.063	2.428	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10	11	12	13
LOG(V)	*	*	*	*	*	*	*	*		*	*	*	*
BD	*	*	*	*	*	*		*	*	*	*		
BRR	*		*			*			*		*	*	*
HO			*			*						*	
TW	*	*		*		*				*	*		
UDNET	*	*							*			*	*
LABC			*	*	*	*	*			*	*		
LFP	*		*		*	*	*	*	*			*	*
PRODHP								*					
RIRL					*		*	*		*		*	*
TFPHPC		*	*		*		*	*					*
TTS		*							*				

All instruments are laged by one year

Table A6: Denmark

LOG(V)

	1	2	3	4	5	6	7	8	9	*Average*
BD	2.026	7.595	1.275	2.178	2.445		8.738	2.441	1.499	*3.525*
	4.013	2.870	2.109	2.779	3.917		3.169	2.357	2.236	
BRR	-7.895							-8.050		*-7.972*
	-5.017							-5.307		
HO			-93.859							*-93.859*
			-3.581							
TW										
UDNET				-11.565	-11.898					*-11.731*
				-4.449	-5.380					
LABC		-6.264								*-6.264*
		-4.176								
PRODHP							-7.438			*-7.438*
							-3.781			
RIRL						-31.512			-31.970	*-31.741*
						-3.025			-3.498	
TFPHPC				17.532		36.663				*27.098*
				1.712		2.607				
TTS			-27.482		-17.249			-16.290		*-20.341*
			-1.683		-1.904			-1.821		
adj. R2	0.627	0.193	0.219	0.614	0.55	0.018	0.077	0.502	0.329	
n	26	26	26	26	26	26	26	26	26	
range	1970-1995	1970-1995	1970-1995	1970-1995	1970-1995	1970-1995	1970-1995	1970-1995	1970-1995	
J-Stat.	1.601	1.961	1.340	4.226	2.930	0.526	1.243	2.589	2.328	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9
BD	*		*	*	*	*			*
BRR	*	*		*			*		
HO	*	*	*		*		*	*	
TW			*	*		*		*	*
UDNET				*	*			*	*
LABC		*	*			*		*	*
LFP									*
PRODHP							*		
RIRL				*	*				
TFPHPC	*	*	*	*		*	*	*	*
TTS			*	*	*	*			

All instruments are laged by one year

Table A7: France

LOG(U)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	*Average*
LOG(V)	0.579	-0.019	0.227	0.294	0.300	0.034	-0.034	-0.075	0.217	0.147	0.085	0.295	0.695	0.196	0.857	*0.253*
	2.559	-0.111	2.083	4.812	3.748	0.484	-0.136	-2.173	1.336	1.843	0.738	1.257	3.042	1.572	3.331	
BD	3.629	3.061														*3.345*
	3.725	5.039														
RR	9.985		4.814	2.829	6.363								8.333		11.242	*7.261*
	2.811		2.659	2.904	5.560								2.487		3.933	
HO			13.821			12.777										*13.299*
			6.618			5.456										
TW				15.432	12.369			12.803		12.582	7.845			8.732		*11.627*
				18.347	10.343			8.294		7.711	2.630			3.061		
UD							-14.414						-11.368			*-12.891*
							-5.251						-4.345			
WR		10.297				4.075		4.280	9.886	3.942		9.585				*7.011*
		9.622				2.886		4.521	7.613	2.843		6.690				
LC											1.298					*1.298*
											3.185					
LFP		0.195					0.262	0.093								*0.184*
		2.522					3.186	3.020								
LP														1.513		*1.513*
														3.268		
RIR									10.739			11.923			18.244	*13.635*
									2.942			2.958			4.219	
TFP	-26.954			-10.034			-21.989			-9.888	-11.086		-24.389	-17.914		*-17.465*
	-2.911			-2.765			-2.363			-2.902	-2.665		-2.296	-4.005		
TTS			-20.873		-12.809	-10.927			-10.675			-12.813			-29.548	*-16.274*
			-2.313		-2.446	-1.938			-2.082			-1.903			-3.413	
adj. R2	0.781	0.924	0.891	0.968	0.945	0.954	0.842	0.981	0.923	0.977	0.983	0.912	0.832	0.969	0.785	
n	32	28	32	32	32	32	27	28	34	32	32	34	32	35	34	
range	1964-1995	1968-1995	1964-1995	1964-1995	1964-1995	1964-1995	1969-1995	1968-1995	1962-1995	1964-1995	1964-1995	1962-1995	1964-1995	1961-1995	1962-1995	
J-Stat.	1.536	2.383	1.134	4.733	2.866	6.117	3.180	1.096	1.523	4.646	0.710	0.312	2.900*	2.270	2.918	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
log(V)	*	*	*		*	*	*	*	*	*		*			*
BD		*	*			*	*		*						
RR			*	*	*	*			*		*	*		*	*
HO	*	*	*	*	*	*	*	*		*	*		*	*	
TW		*		*						*					
UD	*		*	*		*		*		*	*		*	*	*
WR	*	*	*	*	*	*		*	*		*	*		*	*
LC	*		*	*	*	*	*			*	*		*		
LFP							*								
LP														*	
RIR			*		*			*	*	*					*
TFP	*	*		*	*	*					*	*	*	*	
TTS					*		*	*	*	*		*	*		*

All instruments are laged by one year

Table A8: France

LOG(V)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Average*
BD	-3.328	-3.978	-2.838		-4.052									-3.369			*-3.513*
	-4.149	-3.032	-3.253		-3.942									-4.191			
RR						9.721										7.601	*8.661*
						3.294										4.572	
HO		10.680			10.301		41.683	10.076	9.502	11.346							*15.598*
		2.835			3.670		4.936	3.558	3.656	4.554							
TW							-39.784				-20.079						*-29.931*
							-4.872				-4.638						
UD						8.108				6.548		8.213	3.871		6.295		*6.607*
						2.728				3.404		3.124	2.269		3.446		
WR			5.904	6.307							16.431	6.335					*8.744*
			5.714	6.061							7.191	6.226					
LC	1.100												1.250				*1.175*
	3.970												4.874				
LP														1.292	1.970		*1.631*
														3.008	5.436		
RIR				-18.411				-22.109	-21.648	-11.706			-13.618		-12.006	-15.410	*-16.415*
				-5.009				-4.123	-3.723	-3.713			-4.432		-4.198	-4.323	
TFP	28.598		39.257	34.644	27.919	36.553	19.909	25.063		25.754	38.681	40.076	24.357	26.128	22.842	32.622	*30.172*
	4.180		5.451	5.239	3.905	3.225	2.281	2.184		3.262	3.940	5.719	3.029	4.253	3.003	3.667	
TTS		20.284							21.094								*20.689*
		2.171							2.443								
adj. R2	0.681	0.262	0.583	0.572	0.639	0.377	0.401	0.523	0.283	0.696	0.315	0.559	0.718	0.648	0.755	0.509	
n	33	32	35	32	34	34	34	34	34	34	32	35	32	35	32	35	
range	1963-1995	1964-1995	1961-1995	1964-1995	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	1964-1995	1961-1995	1964-1995	1961-1995	1964-1995	1961-1995	
J-Stat.	2.237	8.742**	0.357	1.817	2.545	0.566	4.467	2.505	2.477	0.120	0.102	0.286	1.373	0.001	1.314	2.336	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BD			*			*	*					*				
RR	*	*	*		*			*	*	*		*	*	*	*	*
HO		*	*	*	*	*	*	*		*	*	*				*
TW	*			*				*		*	*		*	*	*	*
UD	*		*		*	*	*	*	*	*		*	*	*	*	
WR	*					*			*	*			*		*	*
LC		*		*							*		*		*	
LFP																
LP																
RIR		*			*											*
TFP	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
TTS		*		*	*	*	*	*	*	*	*		*		*	

All instruments are laged by one year

Table A9: Germany

LOG(U)

	1	2	3	4	5	6	7	8	9	10	11	12	*Average*
LOG(V)	-1.060	-1.233	-1.091	-0.944	-1.121	-1.255	-1.251	-1.017	-0.957	-1.242	-1.174	-0.626	*-1.081*
	-6.949	-7.159	-6.398	-4.306	-5.370	-5.553	-4.901	-4.552	-3.997	-8.700	-7.502	-2.248	
BD	12.775	15.287	12.268	9.516	12.711			7.957	6.290				*10.972*
	4.354	3.885	4.199	2.388	3.314			2.287	1.933				
RR							-18.277	-17.269					*-17.773*
							-3.286	-4.002					
HO			5.626		4.203	14.914							*8.248*
			2.484		2.344	3.444							
TW				8.005					10.678				*9.342*
				2.091					3.565				
UD	-13.642	-15.399	-14.966	-6.329	-15.041	-5.854							*-11.872*
	-4.094	-10.396	-7.433	-1.971	-6.727	-1.866							
LC	0.516									1.265		1.591	*1.124*
	2.091									6.477		3.973	
LFP						0.156	0.099	0.091	0.071	0.170	0.133		*0.120*
						3.791	2.294	2.621	2.111	4.723	3.655		
LP											1.582		*1.582*
											6.543		
RIR												21.140	*21.140*
												2.116	
TFP		9.894					12.125						*11.010*
		3.353					1.994						
TTS													
adj. R2	0.958	0.955	0.953	0.954	0.952	0.938	0.932	0.942	0.949	0.949	0.954	0.920	
n	34	34	34	34	34	34	35	35	35	35	35	35	
range	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	1961-1995	1961-1995	1961-1995	1961-1995	1961-1995	1961-1995	
J-Stat.	1.884	1.498	1.258	0.051	2.141	0.012	0.993	2.494	2.550	0.438	1.597	3.189	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10	11	12
log(V)	*	*	*	*		*	*	*	*	*	*	*
BD	*			*				*	*	*	*	
RR	*	*	*	*	*		*			*	*	
HO	*				*		*		*	*	*	*
TW	*		*			*						
UD		*	*		*	*	*			*	*	*
LC	*	*	*	*			*	*	*			
LFP		*	*	*	*	*	*	*	*			
LP												
RIR	*		*		*	*		*	*			*
TFP					*							
TTS	*	*	*	*	*	*						*

All instruments are laged by one year

Table A10: Germany

	LOG(V)											
	1	2	3	4	5	6	7	8	9	10	11	*Average*
BD		-18.912	-12.060						-14.075			*-15.015*
		-4.490	-2.485						-3.418			
RR	21.238											*21.238*
	5.973											
HO							-13.388					*-13.388*
							-3.423					
TW					-10.014	-15.582						*-12.798*
					-4.664	-9.317						
UD	-14.835			-9.919	-11.738	-14.830		-10.305		-13.236	-11.892	*-12.393*
	-4.031			-2.294	-3.475	-4.781		-2.318		-3.239	-2.781	
LC			-0.985	-1.801				-0.869				*-1.218*
			-3.541	-11.215				-2.058				
LP									-1.034	-2.217	-1.119	*-1.457*
									-3.645	-12.357	-2.115	
RIR	-21.192	-34.138			-34.908		-35.435	-36.417			-35.113	*-32.867*
	-2.632	-3.203			-2.976		-3.660	-3.013			-2.689	
TFP	17.802		36.742	44.249		32.535			33.249	38.889		*33.911*
	1.971		3.970	5.277		4.706			3.926	5.305		
TTS		39.469					28.986					*34.228*
		2.604					2.484					
adj. R2	0.777	0.537	0.578	0.520	0.664	0.716	0.611	0.573	0.618	0.632	0.601	
n	35	35	35	35	34	34	34	35	35	35	35	
range	1961-1995	1961-1995	1961-1995	1961-1995	1962-1995	1962-1995	1962-1995	1961-1995	1961-1995	1961-1995	1961-1995	
J-Stat.	1.180	1.451	4.796*	1.656	0.952	1.776	7.524	1.674	4.395	1.104	1.323	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

	Instruments										
BD		*	*	*	*	*		*	*	*	*
RR	*		*				*		*		
HO	*		*				*		*		
TW				*	*	*				*	
UD	*	*		*	*	*	*	*		*	*
LC				*			*	*			
LFP	*	*			*	*		*			*
LP										*	*
RIR	*	*	*	*	*		*	*	*	*	*
TFP	*	*	*	*	*	*	*	*	*	*	*
TTS		*			*	*	*				

All instruments are laged by one year

Table A11: Netherlands

LOG(U)	1	2	3	4	5	6	7	8	9	10	11	*Average*
LOG(V)	-0.365	-0.364	-0.331	-0.309	-0.291	-0.240	-0.712	-0.318	-0.286	-0.190	-0.294	*-0.336*
	-4.792	-4.517	-4.761	-5.158	-5.509	-2.841	-3.169	-3.661	-2.128	-0.536	-2.493	
BD			1.506	1.994	1.899							*1.800*
			3.199	3.873	4.541							
RR		9.157				8.117	2.952					*6.742*
		2.373				5.803	2.570					
HO			6.043					18.747				*12.395*
			2.614					12.382				
TW						3.366		3.891	11.512	26.874	6.372	*10.403*
						4.469		4.094	3.233	2.077	3.153	
UD				-5.025	-1.780		-7.339				-11.260	*-6.351*
				-5.543	-3.804		-2.790				-5.281	
WR									-10.219	-33.984		*-22.101*
									-3.604	-2.321		
LC		3.746		2.719						6.840	3.969	*4.318*
		4.835		3.753						2.954	9.094	
LFP												
LP	3.199		2.121		3.094	6.618						*3.758*
	6.896		2.669		6.281	13.813						
RIR	11.408	7.812							21.366			*13.529*
	2.522	2.416							3.642			
TFP												
TTS							32.608					*32.608*
							2.255					
adj. R2	0.948	0.884	0.967	0.955	0.966	0.955	0.112	0.958	0.703	0.294	0.887	
n	35	26	31	26	31	26	34	34	31	26	26	
range	1961-1995	1970-1995	1965-1995	1970-1995	1965-1995	1970-1995	1962-1995	1962-1995	1965-1995	1970-1995	1970-1995	
J-Stat.	1.467	0.584	0.285	3.787	3.533	2.989	0.930	1.934	1.967	3.088	2.000	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments	1	2	3	4	5	6	7	8	9	10	11
LOG(V)	*	*	*	*	*		*	*	*	*	*
BD	*		*	*	*	*		*	*	*	
RR	*	*		*		*	*		*	*	*
HO			*			*		*			
TW							*	*	*	*	*
UD	*	*		*	*	*	*	*			*
WR			*	*	*				*	*	
LC		*		*		*				*	*
LFP											
LP			*		*						
RIR		*	*	*	*	*		*		*	*
TFP	*			*	*	*	*	*	*	*	
TTS							*	*			

All instruments are laged by one year

Table A12: Netherlands

LOG(V)

	1	2	3	4	5	6	7	8	9	10	*Average*
BD		-2.513				-1.023					*-1.768*
		-2.391				-1.953					
RR			-21.994				-2.361			-13.439	*-12.598*
			-3.900				-3.083			-3.014	
HO					-18.844						*-18.844*
					-3.974						
TW		-4.646	-7.974	-7.534	-6.462						*-6.654*
		-2.023	-2.258	-2.986	-1.777						
UD				10.046					4.226		*7.136*
				3.675					2.047		
WR		5.568									*5.568*
		2.067									
LC									-4.378	-4.171	*-4.274*
									-2.645	-2.880	
LP	-1.941							-4.415			*-3.178*
	-5.019							-3.178			
RIR	-9.073					-14.631	-14.060				*-12.588*
	-1.955					-2.197	-2.374				
TFP								22.815			*22.815*
								2.007			
TTS											
adj. R2	0.524	0.414	0.286	0.446	0.37	0.476	0.415	0.174	0.154	0.131	
n	34	35	31	34	26	35	34	26	26	26	
range	1962-1995	1961-1995	1965-1995	1962-1995	1970-1995	1961-1995	1962-1995	1970-1995	1970-1995	1970-1995	
J-Stat.	1.891	3.572	3.698	2.105	1.037	1.394	3.289	1.482	0.934	3.616	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

BD		*				*		*		
RR	*					*	*	*		
HO				*		*				
TW	*	*	*	*	*			*	*	*
UD		*					*		*	
WR		*	*		*					*
LC					*			*	*	*
LFP										
LP	*									
RIR	*		*	*	*	*	*	*		*
TFP		*	*	*	*		*	*		
TTS	*	*	*	*			*	*	*	*

All instruments are laged by one year

Table A13: Sweden

LOG(U)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	*Average*
LOG(V)	-1.036	-0.788	-0.924	-0.899	-0.644	-0.563	-0.642	-0.586	-0.589	-0.839	-0.707	-0.641	-0.913	-1.050	*-0.773*
	-18.071	-7.304	-11.932	-16.440	-3.970	-6.365	-8.087	-10.009	-3.998	-20.210	-6.021	-5.680	-12.841	-12.421	
BD				35.928								25.329	34.578		*31.945*
				6.008								2.164	2.091		
RR					3.629										*3.629*
					2.164										
HO									20.821						*20.821*
									3.560						
TW							-6.561			-4.433					*-5.497*
							-4.539			-9.054					
UD						7.091		5.833							*6.462*
						5.414		5.678							
LC			-1.487												*-1.487*
			-3.896												
LFP			-0.090	-0.082	-0.194			-0.069	-0.173			-0.142		-0.069	*-0.117*
			-4.628	-5.173	-4.323			-2.657	-5.213			-4.356		-3.330	
LP														-1.832	*-1.832*
														-4.977	
RIR							8.510				4.470	7.093			*6.691*
							3.129				1.617	3.065			
TFP	20.020		12.140	13.622						14.929	10.536		19.112	17.769	*15.447*
	5.246		4.980	5.977						8.752	2.455		4.688	5.162	
TTS		22.427				9.671					12.474		10.339		*13.728*
		2.121				2.455					1.973		2.889		
adj. R2	0.789	0.223	0.958	0.967	0.868	0.883	0.839	0.944	0.901	0.968	0.655	0.901	0.904	0.952	
N	34	35	19	19	19	19	19	19	19	19	32	19	19	19	
Range	1962-1995	1961-1995	1977-1995	1977-1995	1977-1995	1977-1995	1977-1995	1977-1995	1977-1995	1977-1995	1964-1995	1977-1995	1977-1995	1977-1995	
J-Stat.	2.128	2.124	0.531	1.154	0.592	0.672	0.108	3.190	3.154	1.337	2.894	1.678	0.265	0.758	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOG(V)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
BD	*		*	*	*	*	*			*	*	*		*
RR												*		
HO	*	*									*		*	
TW							*				*	*	*	
UD	*	*						*	*		*		*	
LC			*	*	*			*			*			
LFP			*	*	*	*	*	*	*	*		*	*	*
LP														*
RIR	*	*	*	*	*	*		*		*			*	*
TFP		*	*	*	*	*			*	*	*	*		*
TTS	*					*		*	*		*			

All instruments are laged by one year

Table A14: Sweden

LOG(V)

	1	2	3	4	5	6	7	8	9	10	*Average*
BD	-5.843										*-5.843*
	-2.320										
RR		-0.503				-0.685					*-0.594*
		-1.834				-1.836					
HO			-5.289								*-5.289*
			-1.934								
TW					-1.407						*-1.407*
					-2.159						
UD				-1.797			-2.828	-18.376			*-7.667*
				-2.039			-2.174	-8.689			
LC									-1.137		*-1.137*
									-2.197		
LP										-0.946	*-0.946*
										-1.949	
RIR	-10.071	-9.393	-8.465	-8.750				-10.245	-9.435	-9.505	*-9.409*
	-2.282	-2.193	-1.858	-2.008				-3.012	-3.118	-3.066	
TFP					26.319	25.107	20.450	49.690			*30.391*
					2.285	2.206	2.043	9.685			
TTS											
adj. R2	0.376	0.375	0.393	0.424	-0.018	0.062	0.336	0.819	0.415	0.433	
N	34	34	34	34	35	34	34	19	32	35	
Range	1962-1995	1962-1995	1962-1995	1962-1995	1961-1995	1962-1995	1962-1995	1977-1995	1964-1995	1961-1995	
J-Stat.	3.469	3.990	5.093	5.377	0.030	0.181	2.239	1.164	3.461	7.150**	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10
BD			*	*					*	*
RR	*	*	*	*	*	*				
HO			*	*			*			
TW					*	*	*			
UD	*	*						*	*	*
LC								*	*	
LFP								*		
LP										*
RIR	*	*	*	*				*		
TFP	*	*	*	*	*	*	*	*	*	*
TTS	*	*	*	*		*	*			

All instruments are laged by one year

Table A15: UK

LOG(U)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	*Average*
LOG(V)	-1.041	-0.738	-0.444	-0.554	-0.944	-0.968	-0.645	-1.438	-0.932	-0.552	-0.341	-0.713	-0.522	-2.925	-1.364	-0.470	-0.563	-0.947	-0.356	*-0.866*
	-3.602	-3.532	-2.396	-2.481	-3.941	-3.683	-4.500	-3.918	-3.860	-2.208	-2.703	-2.313	-2.996	-3.568	-3.254	-3.435	-3.148	-3.964	-2.825	
BD			1.389						1.215	1.845	2.016				1.765	1.179			1.811	*1.603*
			4.565						2.827	3.538	8.353				2.941	4.038			5.375	
RR	-3.680	-6.485		-3.163	-4.267	-5.894	-2.310										-2.761	-3.739		*-4.037*
	-3.628	-8.244		-3.826	-5.163	-6.937	-2.601										-3.337	-3.418		
HO	2.154						6.211	6.946	4.122	3.792										*4.645*
	2.926						8.836	8.673	5.981	4.695										
TW	7.180	9.982			6.734	9.126			7.083	9.386	6.982		7.948		9.092			6.554	7.484	*7.959*
	7.469	11.473			5.174	11.370			6.801	5.962	4.983		5.473		6.455			4.442	7.021	
UD			4.478	4.747			5.831	3.778				9.558		3.469		4.549	4.777			*5.148*
			9.085	8.222			7.956	5.747				6.279		2.783		9.111	8.911			
LC			2.830	2.150	0.849						1.912									*1.935*
			21.609	13.201	2.392						7.025									
LFP												0.323	0.237	0.332	0.177					*0.267*
												6.662	2.285	3.599	3.435					
LP																3.086	2.446	1.038	1.912	*2.121*
																21.925	17.063	2.067	8.595	
RIR			6.293	7.040			6.004					18.136	9.032			5.023	5.998			*8.218*
			4.046	4.021			2.876					4.228	2.399			2.953	3.280			
TFP	12.412				9.992	9.405		17.420	13.022					45.561	21.686			10.514		*17.501*
	2.579				2.314	2.581		1.906	3.199					2.756	4.521			2.521		
TTS		10.036								11.459										*10.747*
		2.605								2.956										
adj. R2	0.945	0.913	0.963	0.952	0.95	0.943	0.957	0.904	0.948	0.906	0.963	0.722	0.806	0.54	0.898	0.974	0.966	0.952	0.961	
n	35	34	34	34	34	35	35	34	35	34	35	34	34	34	35	35	35	34	35	
range	1961-1995	1961-1994	1962-1995	1962-1995	1962-1995	1961-1995	1961-1995	1962-1995	1961-1995	1962-1995	1961-1995	1961-1994	1961-1994	1962-1995	1961-1995	1961-1995	1961-1995	1962-1995	1961-1995	
J-Stat.	1.134	0.883	2.213	2.763	1.451	2.618	0.386	0.957	1.273	2.111	2.495	2.048	0.656	5.560	3.180	1.472	1.244	1.795	1.748	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
LOG(V)	*	*	*		*	*	*	*	*	*	*	*	*	*	*			*	
BD		*	*	*		*			*	*	*	*	*		*	*	*		*
RR	*	*	*	*		*			*	*	*		*	*	*	*	*		*
HO	*						*		*	*	*								*
TW	*	*		*	*	*	*		*	*		*	*	*	*	*	*	*	*
UD			*	*			*	*						*	*	*	*		
LC			*	*	*			*						*				*	
LFP	*	*	*	*	*	*		*	*	*		*		*	*			*	
LP																*	*		
RIR	*	*	*	*	*	*	*					*	*			*	*	*	
TFP	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*
TTS		*			*			*		*								*	

All instruments are laged by one year

Table A16: UK

LOG(V)	1	2	3	4	5	6	7	8	9	10	*Average*
BD				-0.858		-0.911				-0.899	*-0.890*
				-1.707		-2.594				-1.757	
RR							2.125	1.172			*1.648*
							2.627	2.137			
HO			-1.217								*-1.217*
			-3.336								
TW		-2.308				-2.766					*-2.537*
		-2.152				-3.357					
UD				-1.792			-2.140		-1.721	-1.742	*-1.849*
				-1.953			-2.719		-2.272	-1.850	
LC	-0.460									-0.506	*-0.483*
	-2.777									-2.962	
LP				-0.536	-0.505						*-0.520*
				-2.935	-3.403						
RIR		-3.092							-2.986		*-3.039*
		-2.648							-1.917		
TFP	9.821	16.407	10.151	15.514	9.503	17.909	12.597	9.082	12.663	15.682	*12.933*
	3.575	4.813	4.123	7.101	3.300	5.584	3.822	3.227	3.110	7.463	
TTS											
adj. R2	0.486	0.360	0.495	0.423	0.498	0.374	0.418	0.434	0.352	0.426	
n	34	34	35	34	35	34	34	34	34	34	
range	1962-1995	1962-1995	1961-1995	1962-1995	1961-1995	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	
J-Stat.	0.921	4.548	2.938	7.010*	0.790	1.426	2.351	6.398	6.549*	7.284*	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments	1	2	3	4	5	6	7	8	9	10
BD	*	*	*		*		*	*	*	
RR	*			*	*	*	*	*	*	*
HO	*	*	*		*					
TW			*	*		*	*	*		*
UD		*	*							
LC	*	*						*	*	*
LFP	*	*	*	*	*	*	*	*	*	*
LP				*	*					
RIR				*			*		*	*
TFP		*		*		*				*
TTS		*		*		*	*	*	*	*

All instruments are laged by one year

Table A17: USA

LOG(U)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	*Average*
LOG(V)	-0.348	-0.860	-0.064	-0.660	-1.000	-0.926	0.260	-0.780	-1.003	0.045	-1.048	-0.999	-1.031	-0.211	0.600	-0.985	0.130	-1.044	0.431	*-0.500*
	-2.239	-6.089	-0.176	-3.020	-10.943	-10.984	0.722	-6.614	-7.362	0.127	-12.758	-14.353	-4.947	-1.204	1.704	-7.295	0.354	-5.633	1.857	
BD			-6.250				-5.948			-5.412			-2.022				-5.736	-1.571		*-4.490*
			-2.644				-2.290			-2.588			-2.244				-2.906	-2.051		
RR	3.993													3.473						*3.733*
	10.577													3.812						
HO		12.922		13.347	17.476	15.846		16.725	14.961		15.969	16.707	14.780			15.307		15.689		*15.430*
		6.018		5.451	10.423	10.859		15.038	6.942		9.449	14.096	5.909			6.914		6.735		
TW		1.555	3.937	2.287											1.625					*2.351*
		3.757	3.398	3.753											2.182					
UD					-2.592							-1.057								*-1.824*
					-5.384							-2.079								
WR	-0.932					-1.194	-2.072	-1.637				-0.949								*-1.357*
	-1.961					-6.878	-2.761	-6.610				-2.406								
LC									0.429	0.943			0.850							*0.741*
									3.714	3.327			3.216							
LFP											0.022								0.024	*0.023*
											5.392								3.090	
LP																0.597	1.309	1.158		*1.021*
																3.560	3.026	3.335		
RIR		2.762				2.129			2.797					3.047		2.864				*2.720*
		2.274				2.679			2.409					2.126		2.369				
TFP	-8.525		-18.752				-34.799			-27.909				-13.444	-28.040		-30.178		-29.522	*-23.896*
	-3.906		-2.143				-4.664			-3.474				-2.587	-5.397		-3.636		-4.834	
TTS				-19.662				-11.683							-37.475					*-22.940*
				-2.663				-2.669							-2.396					
adj. R2	0.803	0.902	0.338	0.759	0.909	0.951	0.145	0.928	0.895	0.201	0.894	0.939	0.796	0.717	0.435	0.892	0.076	0.805	0.182	
n	34	35	34	34	34	35	34	34	35	34	35	35	35	35	35	35	34	35	35	
range	1962-1995	1961-1995	1962-1995	1962-1995	1962-1995	1961-1995	1962-1995	1962-1995	1961-1995	1962-1995	1961-1995	1961-1995	1961-1995	1961-1995	1961-1995	1961-1995	1962-1995	1961-1995	1961-1995	
J-Stat.	9.835	1.914	3.284	0.539	2.579	0.727	2.834	2.444	1.560	5.548	0.337	8.951	4.338	3.122	5.291	1.005	4.647	4.660	3.066	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
LOG(V)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
BD	*				*	*	*			*	*	*					*		
RR	*				*	*		*				*		*	*				
HO		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
TW	*	*	*	*						*		*	*		*		*	*	*
UD	*	*	*			*		*	*			*	*			*		*	*
WR	*				*									*					*
LC	*	*	*	*			*	*	*	*	*		*	*					*
LFP	*					*	*	*	*				*			*		*	
LP																*	*	*	
RIR		*		*	*				*			*		*	*	*			*
TFP			*		*		*	*	*		*	*	*	*	*	*		*	
TTS	*		*	*	*		*	*		*							*		

All instruments are laged by one year

Table A18: USA

LOG(V)

	1	2	3	4	5	6	7	8	9	10	*Average*
BD										6.733	*6.733*
										4.032	
RR			3.472	2.748						4.760	*3.660*
			2.387	3.567						6.138	
HO		8.289			11.569	8.006	9.377				*9.310*
		2.162			7.755	4.497	2.386				
TW	3.853										*3.853*
	3.374										
UD					-1.255	-1.076					*-1.166*
					-1.862	-2.952					
WR								2.420	2.936	2.040	*2.466*
								2.677	2.599	4.360	
LC		0.895						1.234			*1.064*
		1.937						4.066			
LP							1.388		2.208		*1.798*
							1.878		3.394		
RIR	-8.003	-5.523	-3.826		-2.985		-5.854				*-5.238*
	-2.833	-2.350	-2.035		-2.877		-2.275				
TFP	21.879	23.237	31.412	22.169	21.097	18.979	23.992	10.184	9.798	25.735	*20.848*
	3.556	3.884	3.824	5.069	7.999	8.475	3.707	3.798	3.144	8.705	
TTS				27.257		27.065		26.251	28.456		*27.257*
				4.586		3.654		2.751	2.764		
adj. R2	0.078	0.207	-0.515	0.475	0.516	0.660	0.145	0.537	0.368	0.460	
n	35	34	34	34	34	34	34	34	34	34	
range	1961-1995	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	1962-1995	
J-Stat.	2.393	0.237	1.724	2.895	1.229	0.887	0.898	2.807	1.883	0.227	

Numbers under the coefficients are HAC t-Statistics. J-Statistic: H_0 = exogenous instruments, *(**) H_0 is rejected at the 10% (5%) level.

Instruments

	1	2	3	4	5	6	7	8	9	10
BD					*		*	*	*	*
RR	*	*	*	*		*	*			
HO					*	*				*
TW	*	*			*	*	*	*	*	*
UD	*	*		*	*	*	*			
WR	*			*				*	*	*
LC			*	*	*	*		*	*	*
LFP			*	*						
LP										
RIR										
TFP	*	*	*	*		*	*	*	*	
TTS		*	*	*	*	*	*	*	*	*

All instruments are laged by one year

Table B1: Austria

	BD	RR	HO	TW	UD	LC	LFP	LP	RIR	TFP	TTS
Mean	0.466	0.268	0.466	0.550	0.525	5.260	67.297	5.956	0.035	0.000	-0.005
Median	0.739	0.310	0.463	0.567	0.521	5.500	66.300	6.088	0.039	-0.001	-0.006
Maximum	0.752	0.376	0.550	0.602	0.600	5.644	72.100	6.294	0.055	0.034	0.024
Minimum	0.000	0.113	0.380	0.452	0.407	4.435	63.800	5.287	0.001	-0.028	-0.036
Std. Dev.	0.359	0.087	0.061	0.045	0.053	0.393	2.725	0.312	0.014	0.017	0.011
Observations	36	36	36	36	36	35	34	36	31	36	35

Table B2: Canada

	BD	RR	HO	TW	UD	WR	LC	LFP	LP	RIR	TFP	TTS
Mean	0.259	0.519	0.618	0.415	0.334	0.449	3.209	71.160	3.766	0.040	0.000	-0.003
Median	0.242	0.578	0.614	0.419	0.357	0.440	3.217	73.000	3.802	0.037	0.003	-0.003
Maximum	0.359	0.653	0.660	0.516	0.386	0.530	3.391	78.600	3.960	0.096	0.024	0.012
Minimum	0.178	0.351	0.600	0.299	0.259	0.390	2.916	63.275	3.447	-0.046	-0.038	-0.018
Std. Dev.	0.059	0.094	0.014	0.059	0.041	0.045	0.125	5.497	0.148	0.030	0.014	0.008
Observations	36	36	36	36	36	36	30	43	36	36	36	35

Table B3: Denmark

	BD	RR	HO	TW	UD	LC	LFP	LP	RIR	TFP	TTS
Mean	0.686	0.509	0.495	0.515	0.702	4.878	79.243	5.517	0.056	0.000	-0.004
Median	0.639	0.598	0.510	0.542	0.740	4.998	80.100	5.564	0.057	-0.001	-0.005
Maximum	1.016	0.718	0.520	0.647	0.808	5.199	84.100	5.808	0.121	0.027	0.056
Minimum	0.521	0.235	0.430	0.289	0.599	4.310	71.200	5.118	0.004	-0.028	-0.046
Std. Dev.	0.124	0.167	0.026	0.102	0.080	0.257	3.220	0.198	0.030	0.016	0.018
Observations	36	36	36	36	36	36	37	36	36	36	35

Table B4: France

	BD	RR	HO	TW	UD	WR	LC	LFP	LP	RIR	TFP	TTS
Mean	0.320	0.555	0.487	0.611	0.172	0.557	4.705	67.949	5.355	0.034	0.000	-0.002
Median	0.270	0.575	0.495	0.608	0.191	0.580	4.834	68.100	5.425	0.035	-0.001	-0.003
Maximum	0.508	0.634	0.540	0.680	0.222	0.630	5.081	69.700	5.726	0.073	0.025	0.057
Minimum	0.169	0.440	0.410	0.538	0.099	0.430	4.009	66.500	4.744	-0.023	-0.017	-0.037
Std. Dev.	0.123	0.049	0.045	0.046	0.044	0.059	0.333	0.938	0.290	0.025	0.011	0.014
Observations	36	36	36	36	36	41	33	35	36	36	36	35

Table B5: Germany

	BD	RR	HO	TW	UD	LC	LFP	LP	RIR	TFP	TTS
Mean	0.596	0.396	0.366	0.478	0.332	3.534	69.656	4.154	0.038	0.000	-0.003
Median	0.603	0.391	0.380	0.485	0.332	3.686	69.400	4.226	0.039	0.000	-0.004
Maximum	0.626	0.427	0.400	0.541	0.355	3.876	72.300	4.509	0.062	0.025	0.033
Minimum	0.561	0.363	0.290	0.416	0.274	2.821	66.400	3.596	0.007	-0.026	-0.038
Std. Dev.	0.023	0.020	0.031	0.037	0.018	0.328	1.610	0.270	0.013	0.013	0.013
Observations	36	36	36	36	36	36	43	36	36	36	35

Table B6: Netherlands

	BD	RR	HO	TW	UD	WR	LC	LFP	LP	RIR	TFP	TTS
Mean	0.469	0.630	0.387	0.521	0.333	0.569	3.780	64.044	4.253	0.030	0.000	-0.008
Median	0.503	0.650	0.403	0.545	0.362	0.580	3.788	61.750	4.388	0.030	0.000	-0.012
Maximum	0.695	0.700	0.440	0.572	0.417	0.660	3.928	76.300	4.418	0.071	0.038	0.097
Minimum	0.000	0.283	0.290	0.433	0.240	0.470	3.509	56.600	3.757	-0.032	-0.036	-0.087
Std. Dev.	0.200	0.114	0.051	0.050	0.062	0.060	0.095	6.871	0.214	0.029	0.019	0.029
Observations	36	36	36	36	36	37	27	32	36	36	36	35

Table B7: Sweden

	BD	RR	HO	TW	UD	LC	LFP	LP	RIR	TFP	TTS
Mean	0.03	0.48	0.39	0.66	0.75	5.04	79.94	5.53	0.03	0.00	0.00
Median	0.05	0.62	0.40	0.73	0.79	5.09	80.60	5.56	0.03	0.00	0.00
Maximum	0.05	0.74	0.42	0.83	0.91	5.26	83.00	5.84	0.09	0.02	0.07
Minimum	0.00	0.10	0.35	0.37	0.63	4.58	76.80	5.11	-0.05	-0.02	-0.04
Std. Dev.	0.02	0.26	0.03	0.14	0.09	0.18	2.02	0.19	0.03	0.01	0.02
Observations	36	36	36	36	36	33	27	36	36	36	35

Table B8: UK

	BD	RR	HO	TW	UD	LC	LFP	LP	RIR	TFP	TTS
Mean	0.675	0.292	0.554	0.449	0.483	2.212	73.863	2.780	0.027	0.000	-0.002
Median	0.681	0.286	0.543	0.464	0.484	2.234	73.700	2.802	0.033	0.001	-0.006
Maximum	0.891	0.380	0.680	0.529	0.575	2.514	76.900	3.102	0.069	0.039	0.070
Minimum	0.514	0.215	0.420	0.332	0.367	1.780	72.000	2.373	-0.102	-0.029	-0.029
Std. Dev.	0.113	0.057	0.087	0.056	0.056	0.226	1.411	0.220	0.033	0.016	0.018
Observations	36	36	36	36	36	35	41	36	36	36	35

Table B9: USA

	BD	RR	HO	TW	UD	WR	LC	LFP	LP	RIR	TFP	TTS
Mean	0.166	0.261	0.654	21.256	0.224	0.432	3.180	74.184	3.727	0.031	0.000	0.000
Median	0.166	0.245	0.650	22.300	0.242	0.430	3.209	74.800	3.734	0.026	0.001	-0.001
Maximum	0.227	0.357	0.680	30.300	0.288	0.550	3.379	79.600	3.883	0.086	0.024	0.024
Minimum	0.000	0.206	0.640	13.000	0.149	0.340	2.842	67.100	3.508	-0.013	-0.023	-0.009
Std. Dev.	0.041	0.041	0.013	5.631	0.046	0.059	0.142	4.435	0.093	0.024	0.012	0.006
Observations	36	36	36	41	36	41	36	43	36	36	36	35