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Abstract

In this paper I investigate how the labor productivity growth is affected from various institutions of the labor market using the empirical evidence from a panel data of OECD countries. I find that benefit replacement rate, benefit duration index, and the tax wedge appear to be significant labor market institutions affecting the labor productivity growth. A higher benefit replacement rate, a longer duration of unemployment benefits, and a higher tax wedge are expected to generate a lower labor productivity growth.

Keywords: Labor Market Institutions, Labor Productivity Growth

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1 Introduction

The structure of labor markets has been an important area of research for many economists. Many of these studies have focused on explaining the unemployment differences across the countries by the differences in their labor market institutions. Blanchard and Wolfers (2000) investigate the interaction between shocks and labor market institutions in explaining the cross country differences in the rise of European unemployment. Fialova and Schneider (2008) explore the role of labor market institutions on different labor market developments in European Union member countries particularly focusing on new member countries.

The labor market institutions have also been incorporated in dynamic stochastic general equilibrium models in order investigate their effect on business cycle dynamics. Macit (2010) incorporates search and matching frictions in an otherwise New Keynesian model and investigates whether the level of unemployment benefits and firing costs affect the business cycle dynamics. He finds that a higher level of unemployment benefit and a stricter employment protection legislation generate less volatile and more persistent movements in inflation and real wages and the level of these labor market institutions affect how wages and inflation respond to exogenous shocks. Thomas (2006) investigates the relationship between output and employment volatility and firing costs and finds that countries with lower levels of firing costs tend to have lower output and employment volatility. Campolmi and Faia (2007) explore whether the differences in labor market structures observed among European Union countries are important in explaining the inflation differentials.

In this paper I investigate the link between labor market institutions and labor productivity growth. To the best of my knowledge, it is the first paper that explores whether the labor productivity growth is affected from labor market

institutions. For this purpose I take a panel data of 20 OECD countries covering the period from 1970 to 2006. Benefit replacement rate, benefit duration index, union density, employment protection legislation index, and the tax wedge are the labor market variables that capture different aspects of the labor market. I find that benefit replacement rate, benefit duration index, and the tax wedge are significant in explaining the labor productivity growth.A more generous unemployment benefit system and a longer duration of unemployment benefits are expected to generate a lower productivity growth. A higher tax burden is also expected to lead to a lower labor productivity growth.

The paper proceeds as follows. The next section presents the empirical model and gives a description of the data. Section III presents the estimation results and Section IV concludes.

2 Empirical Model and Data

2.1 Empirical Model

This section presents the empirical model that I use to investigate the relationship between labor market institutions and labor productivity growth. The reduced form equation that is going to be estimated can be summarized as follows:

$$prod_{it} = \alpha + \beta' LMI_{it} + \lambda_i + \varepsilon_{it} \tag{1}$$

where $prod_{it}$ refers to labor productivity growth for country i at time t. LMI_{it} is a vector of labor market institutions and λ_i measures the country fixed effects. The model is estimated using the fixed effecs estimation method.

2.2 Data

The sample that I use includes data from 20 OECD countries namely Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States. The labor market institutions data is taken from Nickell (2006) and is an annual data covering the period from 1970 to 2006. The data for labor productivity growth is obtained from OECD Economic Outlook database. The labor market institutions that are used in the model are employment protection legislation index, union density, benefit replacement rate, benefit duration index, and tax wedge.

Employment protection legislation index, EPL_{it}, takes a value between 0 and 2 and a higher number implies that there are stricter employment protection legislations in that country. The index captures the features of the labor market such as notice of dismissal, difficulty of dismissal, severance pay etc.

Union density, UD_{it}, is the ratio of total union members to total employment. The series is calculated using the administrative and survey data from OECD labor market statistics database.

The benefit replacement rate, $BRR_{it,}$ measures the level of unemployment benefits as a percentage of average earnings before tax. It is calculated as the average across the first five years of unemployment.

Benefit duration index, BD_{it}, is taken as an indicator of how long the unemployment benefits last for. Nickell (2006) calculate the index as follows:

$$BD = 0.6 * \frac{BRR_2}{BRR_1} + 0.4 * \frac{BRR_4}{BRR_1} \tag{2}$$

where BRR_1 is the benefit replacement rate that prevails during the first year of unemployment, BRR_2 is the benefit replacement rate that prevails during the second and third year of unemployment, and BRR_4 is the benefit replacement

rate received during the fourth and fifth year of unemployment. For instance, if the worker cannot get any unemployment benefits after one year then $BRR_2 = BRR_4 = 0$ and the index will take a value of zero.

The total tax wedge, TW_{it}, measures the total tax burden and is calculated as the sum of employment tax rate, the direct tax rate, and the indirect tax rate.

Table 1 gives a summary of the labour market institutions for the 20 OECD countries. It gives the average values of labour market variables for the period 1970 to 2006. The table shows that there is a huge cross country variation in terms of labour market institutions. For instance, in the benefit replacement rate one can observe countries like Denmark and Netherlands who pay unemployment benefits more than 50 percent of average earnings before tax. However, one can also see countries like Japan and Italy who pay only 10 percent of average earnings before tax in the form of unemployment benefits. For the other labour market variables the same type of large variation can be observed.

3 Estimation Results

There are two very commonly used estimation techniques used in panel data estimation namely the fixed effects estimation and random effects estimation. The fixed effects model treats the λ_i in equation (1) as fixed unknown parameters. The random effects model on the other hand treats the individual country effects as random. The important assumption behind the random effects model is that the $\lambda_i's$ are independent of the explanatory variables in LMI_{it}. In order to decide which model to use I use the Hausman test which tests the null hypothesis that the explanatory variables and λ_i are uncorrelated. The fixed effects estimator is consistent both under the null and alternative hypothesis whereas the random effects estimator is consistent only under the null hypothe-

sis. For Hausman test rejecting the null hypothesis implies that the fixed effects estimator should be preferred to random effects estimator as the latter one is inconsistent. The Hausman test statistic can be computed as:

$$\xi_H = (\widehat{\beta}_{FE} - \widehat{\beta}_{RE})'[V(\widehat{\beta}_{FE}) - V(\widehat{\beta}_{RE})]^{-1}(\widehat{\beta}_{FE} - \widehat{\beta}_{RE}) \tag{3}$$

Under the null hypothesis the Hausman test statistics has an asymptotic χ^2 distribution with degrees of freedom equal to the number of explanatory variables in LMI_{it} vector. The value of the test statistic is obtained as 29.71 which is significantly higher than $\chi^2(5)$ even at 1% significance level. Therefore, one can reject the null hypothesis which implies that the model should be estimated with fixed effects model.

Table 2 shows the results under fixed effects estimation. As the data for tax wedge is missing or incomplete for some countries I run two different models with the first one not including the tax wedge and the second one having the tax wedge as an explanatory variable. Before getting into interpretation of the results I first carry out a test for the joint significance of the country fixed effects. That is I test the null hypothesis that all $\lambda_i's$ are equal to zero against the alternative that at least some of them are different from zero using an F test. The resulting F values for the first and second model are 7.16 and 5.86 respectively. Both of these values are higher than the critical F values which allows one to reject the null hypothesis.

Table 2 shows that under both models the benefit replacement rate and the benefit duration index are statistically significant and they have a negative impact on labor productivity growth. That is in countries where workers receive higher levels of unemployment benefits and they are entitled for unemployment benefits for longer durations that is expected to generate a lower labor productivity growth. Intuitively this makes sense as a more generous unemployment

benefit and a longer duration for those benefits imply a better outside option for the worker and that reduces the incentive of the worker to increase his productivity. The second model shows that tax wedge is also a significant labor market institution in explaining the labor productivity growth. If there is a higher tax burden on the worker that is expected to reduce the labor productivity growth.

4 Conclusion

In this paper I investigate whether the labor market institutions play a role in explaining the labor productivity growth. I find that if there are high unemployment benefits and workers are entitled for these beenfits for a longer duration that is expected to generate a lower labor productivity growth. The tax wedge also appears to have a significant impact on labor productivity growth. The results show that a higher tax wedge is expected to reduce the labor productivity growth.

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Table 1: Average values of the labor market institutions over the period 1970-2006

Country	EPL	UDEN	BRR	BD	TW
Australia	0.324	42.888	23.238	1.017	34.975
Austria	0.872	50.194	28.141	0.636	55.032
Belgium	0.959	52.400	42.497	0.802	54.320
Canada	0.270	34.276	18.012	0.000	42.561
Denmark	0.669	74.191	50.212	0.694	59.373
Finland	0.744	70.406	30.147	0.539	56.738
France	0.998	14.881	32.838	0.379	60.788
Germany	0.974	31.852	28.318	0.602	51.821
Ireland	0.269	51.216	27.509	0.583	34.744
Italy	1.124	41.670	9.576	0.075	50.668
Japan	0.690	28.110	10.374	0.000	30.251
Netherlands	0.871	29.776	51.091	0.603	52.250
Norway	0.948	56.128	29.432	0.452	60.806
New Zealand	0.324	44.900	29.279	1.025	NA
Portugal	1.507	39.452	22.012	0.236	39.155
Spain	1.835	12.500	29.135	0.215	42.412
Sweden	0.356	79.700	23.741	0.042	70.179
Switzerland	0.337	26.625	19.447	0.080	32.662
United Kingdom	0.196	41.870	20.482	0.680	41.906
United States	0.070	18.682	12.697	0.187	32.850

Table 2: Estimation Results for the Labor Productivity Growth

EPL	-0.0653	-0.0517
BRR	-0.0395***	-0.0304*
UDEN	0.0029	0.0186
BD	-1.9750**	-2.5862***
TW	-	-0.0422**
#observations	573	501
R^2	0.05	0.09

Notes: In terms of the statistical significance of the coefficient estimates * denotes the significance at 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. The regression also includes dummy variables for each country to represent the fixed country effects but they are not reported here.