

## **ECONOMIC GROWTH AND LABOUR DEMAND<sup>1</sup>**

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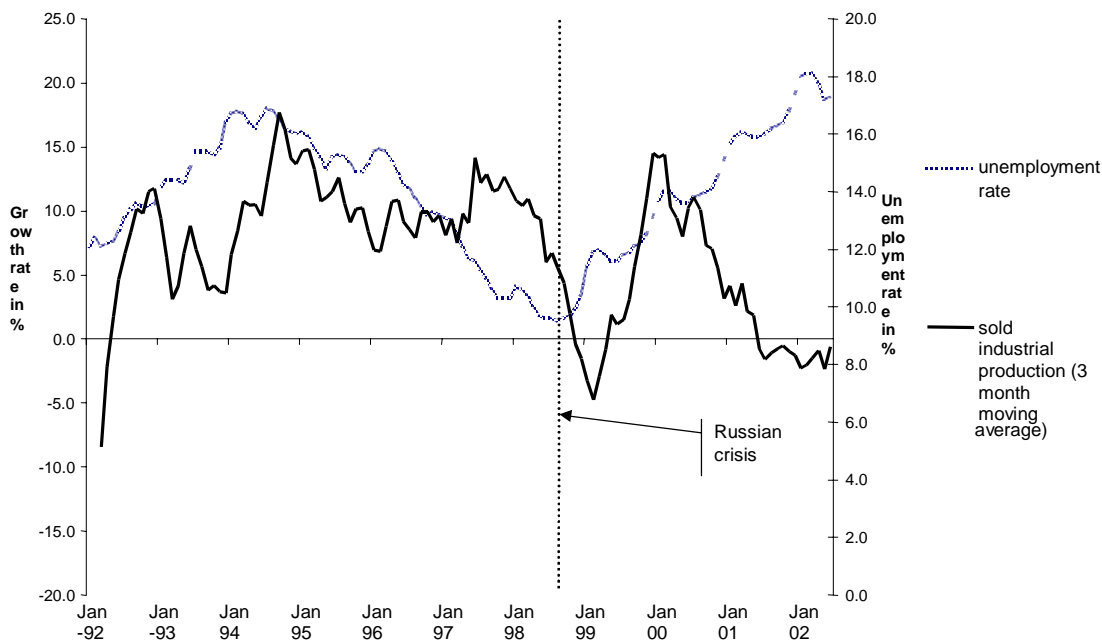
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<sup>1</sup> Paper for the conference “Structural reforms and monetary policy”, Falenty, 24-25 October, 2002.

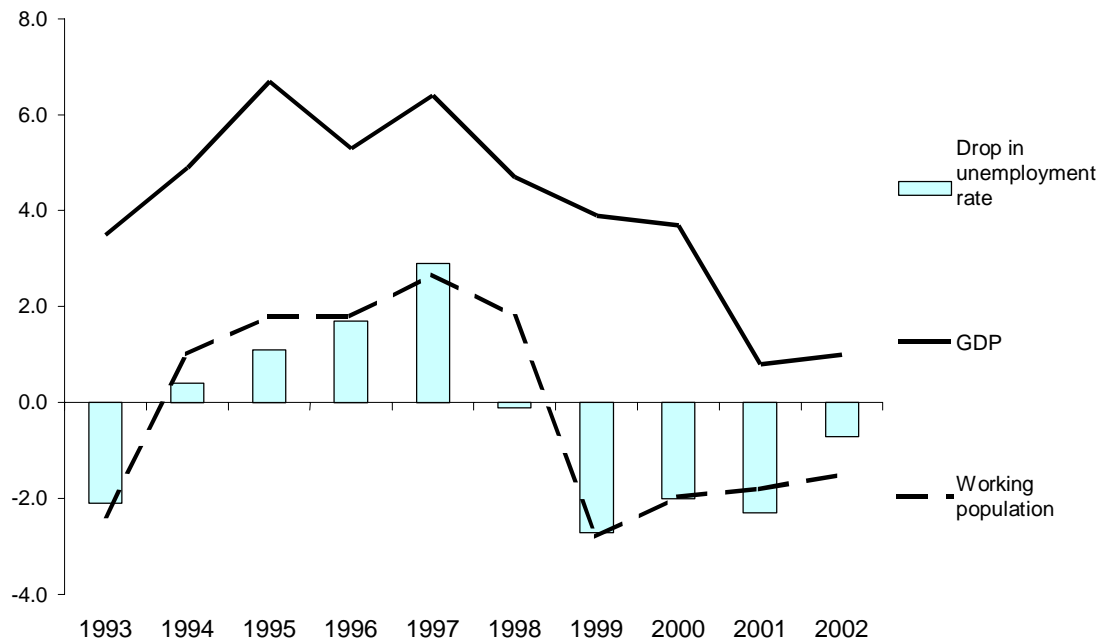
## ECONOMIC GROWTH AND LABOUR DEMAND IN POLAND – DESCRIPTIVE ANALYSIS

The unemployment rate in Poland has been growing since September 1998. The downward trend of the unemployment rate, which lasted from February 1994 till August 1998 (the registered unemployment rate fell from 16.8 to 9.5%) was reversed in mid-August 1998, soon after the Russian crisis. Since then the unemployment rate has been growing continuously to reach 18% in mid 2002. The unfavourable phenomenon is influenced by both the demographic factors (working age population is expected to continue to grow till 2005) and a slowdown in economic growth, as well as a decline in labour demand<sup>2</sup> (Fig. 1).



**Fig. 1 The registered unemployment rate and the rate of industrial output sold (in comparable periods), March 1991 – June 2002.**

Fig. 2, which presents annual data, indicates that labour demand growth rate and the annual drops in the registered unemployment rate (in percentage points) display very similar tendencies. The labour demand dynamics, in turn, is closely correlated with the economic growth rate (especially in the period 1993 – 1998).



**Fig. 2 GDP growth rate, employment growth rate, fall in unemployment rate in the period 1993 - 2002**

It is assumed on this basis that, once the economy returns onto the path of fast economic growth rate the unemployment rate will start to fall. However, this seemingly obvious thesis is difficult to defend.

GDP and employment dynamics in 1999 and subsequent years indicates that the interdependencies witnessed in the period 1993 – 1998 have changed and thus the extrapolation of historic trends can lead to wrong conclusions.

We believe the Russian crisis pushed the Polish economy into the second stage of transition, in which it had to activate its competitiveness reserve linked with tapping human resources.

It is estimated that the shock of transition in 1990 made circa 30% of the fixed assets suddenly useless: they could not be used for a new type of production, which would be accepted on the market. The same lot should have befallen the labour force. Lack of proper

<sup>2</sup> According to the Small Statistical Yearbook of 2001 the working age population increased in the period 1995 – 2000 by 1008 thousand people (during the former five-year period it grew only by 685 thousand), the economically active population increased by 296 thousand (in the period 1990 – 1995 the number decreased by 267 thousand), the working population fell by 231 thousand and the registered unemployment grew by 527 thousand.

education (Tab. 1), low occupational and spatial mobility and inability to meet market economy requirements should have made a considerable proportion of the human resources unable to provide services, which would be accepted by the market. Even more so, since a minimum wage was set. Had it not been for institutional barriers limiting idle employment reduction, the scale of cuts in human resources should have been similar to the reduction of capital resources. Since at the end of 1989 the working population amounted to circa 10 million, at the very outset of transition about 3 million people should have been made redundant.

This was however not the case. On the one hand, the fear of rising unemployment led to amendments to the labour code, which made collective redundancies difficult or even impossible. On the other hand, low quality labour for which there was no demand in the company sector<sup>3</sup> could still be used (usually on a self-employment basis) to produce low quality goods. They were difficult to sell on the increasingly competitive Polish market but found buyers relatively easily in Russia and other CIS countries.

The period 1990 – 1993 witnessed a dramatic increase in the number of small companies, active in the household sector (without the agricultural household sector), which between 1993 and 1998 accounted for about 22% of GDP. The share was much greater than in developed economies, where self-employed individuals and civil partnerships generate no more than 10% of GDP. The Polish phenomenon was therefore exceptional and constituted a by-product of the demand shock experienced at the outset of the transition, whose impact on the economy should gradually abate<sup>4</sup>.

**Tab. 1 Working population and the unemployed by education**

Education	Working population 4 quarter 2000	Registered unemployed	
		2000	1995
Higher	14.1	2.6	1.5
Vocational	30.5	20.8	20.2

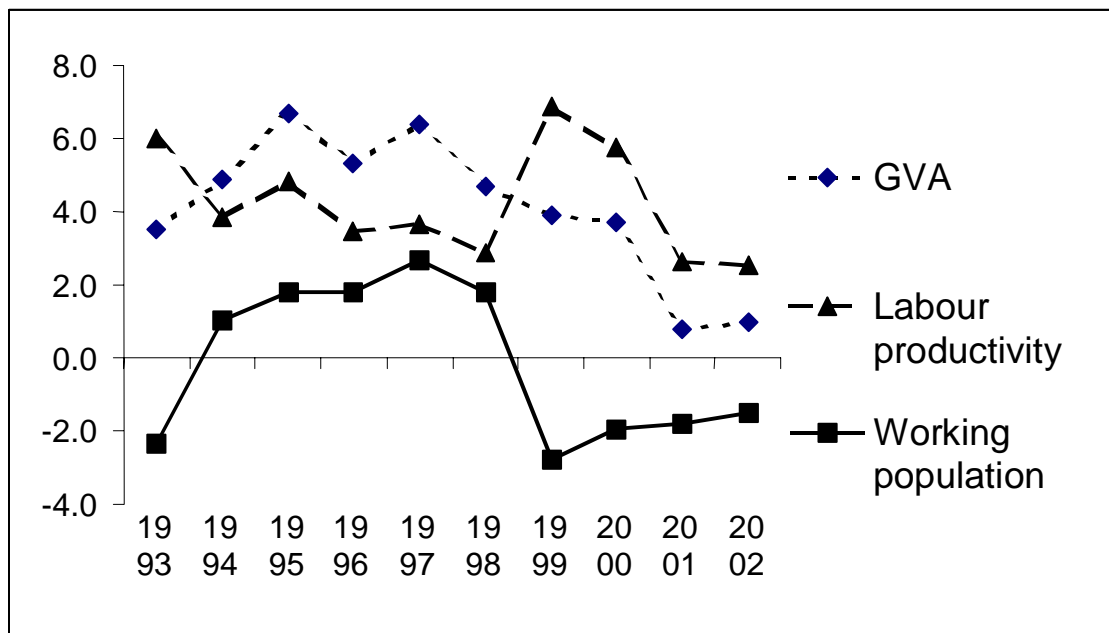
<sup>3</sup> In the period 1990 – 1995 the average employment in the economy fell by more than 2 million people, while the working population decreased by 1.4 million. More than 600 thousand people became self-employed.

<sup>4</sup> In the labour market report published in 1999, OECD indicates that also in its member states self-employment acts as a buffer between employment and unemployment. When labour demand goes down the number of the self-employed grows, and conversely, when the demand rises, the number of the self-employed falls.

General secondary	7.0	6.2	7.2
Basic vocational	33.6	37.0	39.0
Primary	14.8	33.4	32.1

Source: *Small Statistical Yearbook 2001, tab.5(90) and 12(97)*

The demand shock, which followed the Russian crisis in mid-1998 led to mass closures of firms producing for the Russian market and the markets of other CIS countries, and was one of the causes of the increase in unemployment as early as in September 1998. At the same time the Russian crisis prompted employment restructuring in the company sector, which was until then put on hold. Companies trying to remain competitive were forced to mobilize their potential to increase labour productivity (especially in the private enterprise sector) and reduce employment. Fig. 3 presents data, which shows that 1999 and 2000 witnessed high labour productivity increases, which were originally caused by the reduction in the number of workers (and employment).

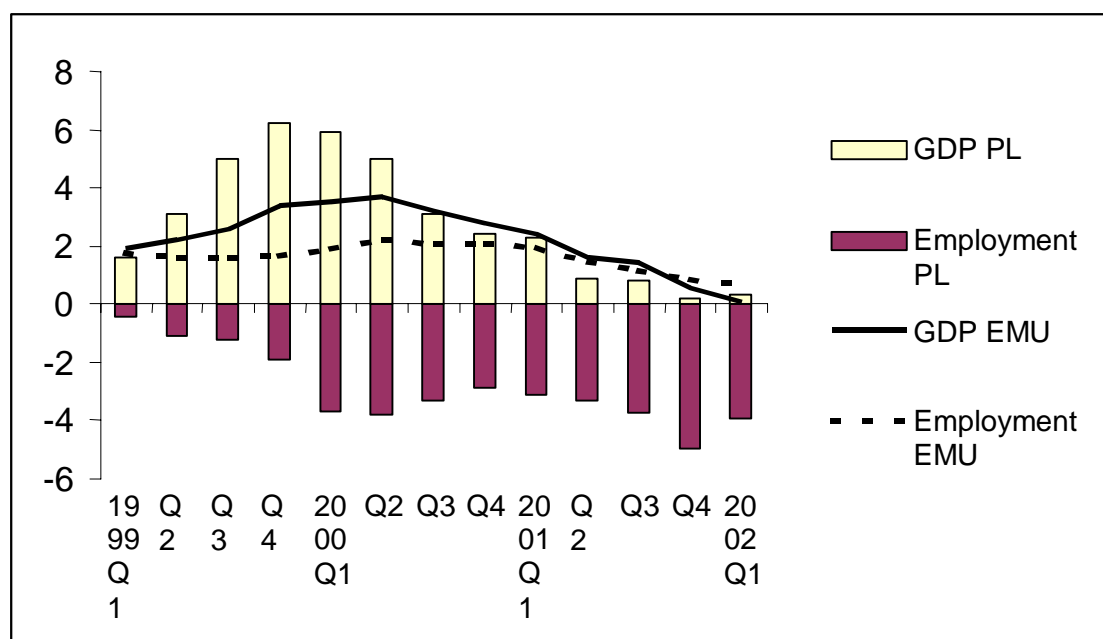


**Fig. 3** GVA, working population and labour productivity growth rates in the period 1993 – 2002.

Thus, a thesis could be proposed, that the Russian crisis deprived small firms active in the household sector of the market, which was their structural match<sup>5</sup>, and expedited the

<sup>5</sup> Reorientation of the production for the domestic or EU market was impossible due to high costs and a low level of education of the management.

process of tapping the competitiveness reserves in the company sector by reducing employment, in particular by laying off people with lowest qualifications. Thus, after an 8-year delay, the market has identified the segment of uncompetitive labour for which, at the current degree of regulation on the labour market, there is no demand. To return this part of the human resources back to work would require on the one hand “liberalization” of wages and on the other hand some capital expenditures to raise the quality of human capital resources (increased quality of labour).



**Fig. 4 GDP and employment growth rate in Poland and the Euro zone in the period of global slowdown**

In the pre-accession period and in the years directly after gaining the EU membership the Polish labour market will remain under the influence of factors, which weaken the correlation between labour demand and the output dynamics. The convergence of economic systems creates relentless pressure to increase wages. Even now we are witnessing a trend to close quickly the wage gap between the successful transition economies of the Central and Eastern Europe and the countries of Western Europe<sup>6</sup>.

<sup>6</sup> The average wage in Poland in 1989, before market reforms, amounted to – at free market rate – 1.5% of the wage in Germany. Now, it has reached the level of 18% of the German wage, 17% of the wage in the former Länder and 23% of the wage in the new Länder. It may still not seem very much, but the Portuguese and German wage ratio back in 1985 was only 22%! If successful transition and EU membership will lead to further reduction of wage disparities, the wage gap between Poland and Germany may resemble the gap, which appeared in the European Union between Portugal and Germany during their membership (Orłowski, 2001).

An increase in the labour costs in a situation where the economy needs to maintain/ raise its competitiveness has to be compensated by an adequately higher labour productivity growth rate<sup>7</sup>. Wage growth rate will necessitate significant increases in labour productivity, which in turn, together with the GDP growth rate, will determine whether and to what degree it will be accompanied by a rise in employment.

Even once the economy is back on the track of rapid economic growth, the growth will be possible without increasing costly employment, because (a) the level of labour productivity is still low in comparison with the EU countries, and (b) as a result of wage convergence labour costs will continue to grow in absolute terms and in relation to the cost of capital, which will be going down. In this situation the barrier to an increase in employment will be low qualifications of jobseekers. With the labour market regulated as it is now, the market price of their work is much lower than minimum wage.

With a permanent, objective upward trend in the labour costs and unrealized potential to increase labour productivity the jobs created in companies do not have to contribute to an increase in employment on the general economy level. They lead rather to replacing former employees with better paid and better qualified ones, as an effort to reduce employment. The unit labour cost will continue to grow, accompanied however by falling employment. As a result of the process, the growing costs of unskilled work (index linking of minimum pay) which can easily be automated will force the enterprises to choose such technological solutions, which will replace unskilled work. Thus, unskilled workers will constitute the most numerous category of the unemployed.

The article presents the results of the studies on the relationship between economic growth, labour cost and labour demand in the OECD countries in the period 1961 – 1994. On this basis, the paper suggests that, unless something is done to make it profitable for private employers to hire low-skilled workers, who would perform unskilled work, the employment will not grow even if GDP grows at a rate of 5 – 6%. Coupled with the demographic pressure on the labour market during the next 5 years and the necessary economic restructuring this will result in an increase in the unemployment rate up to circa 20%.

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<sup>7</sup> Unit labour cost is defined as the cost of labour in a unit of product or product volume. The linking element between unit labour costs and the wage is labour productivity. Higher unit labour cost means higher employment costs per worker with the same labour productivity; it indicates lower efficiency of production and lower competitiveness. If the labour cost per employee grows more quickly than labour productivity it leads to a decline in the company's competitiveness.

**THE RELATIONSHIP BETWEEN LABOUR DEMAND AND ECONOMIC GROWTH –  
ECONOMETRIC ANALYSIS<sup>8</sup>**

The macroeconomic relationship between economic growth rate and the working population growth rate can be expressed by the following formula:

$$E. \quad r_e = \alpha + \beta * r_{GDP} ;$$

where  $r_e$  and  $r_{GDP}$  are employment growth rate and GDP growth rate, respectively, while  $\alpha$  and  $\beta$  are structural parameters:  $\alpha$  is the hypothetical employment loss rate when GDP growth is zero, while  $\beta$  is GDP elasticity of employment<sup>9</sup>.

On the basis of the equation (E.) we can calculate what economic growth rate is needed in the economy to ensure employment growth (with zero economic growth rate employment drops at a rate equaling  $\alpha$ ). When we substitute  $r_e = 0$  we have the economic growth rate which does not result in employment growth<sup>10</sup>  $r_{GDP} = -\alpha/\beta$ .

**POLAND– ANNUAL DATA**

The results of the estimation of the equation parameters (E.) achieved for Poland based on the sample from the period 1993 – 2000<sup>11</sup>.

$$E. 1 \quad r_e = -2.159 + 0.700 * r_{GDP} - 2.807 * u_{prod} ;$$

where  $u_{prod}$  is a dummy, which amounts to 1 in the years of an abrupt increase in labour productivity as a result of reducing employment (1993, 1999, 2000, see Fig. 3).

<sup>8</sup> On the basis of research carried out within the framework of PCZ no. 001 16/01 RYNEK PRACY WOBEC INTEGRACJI Z UNIĄ EUROPEJSKĄ (LABOUR MARKET AND THE EUROPEAN INTEGRATION)

<sup>9</sup> When GDP elasticity of labour equals 1 the equation (2) is the linear version of the identity defining the production growth rate as the product of employment growth rate and labour productivity growth rate. The parameter  $-\alpha$  expresses labour productivity growth rate.

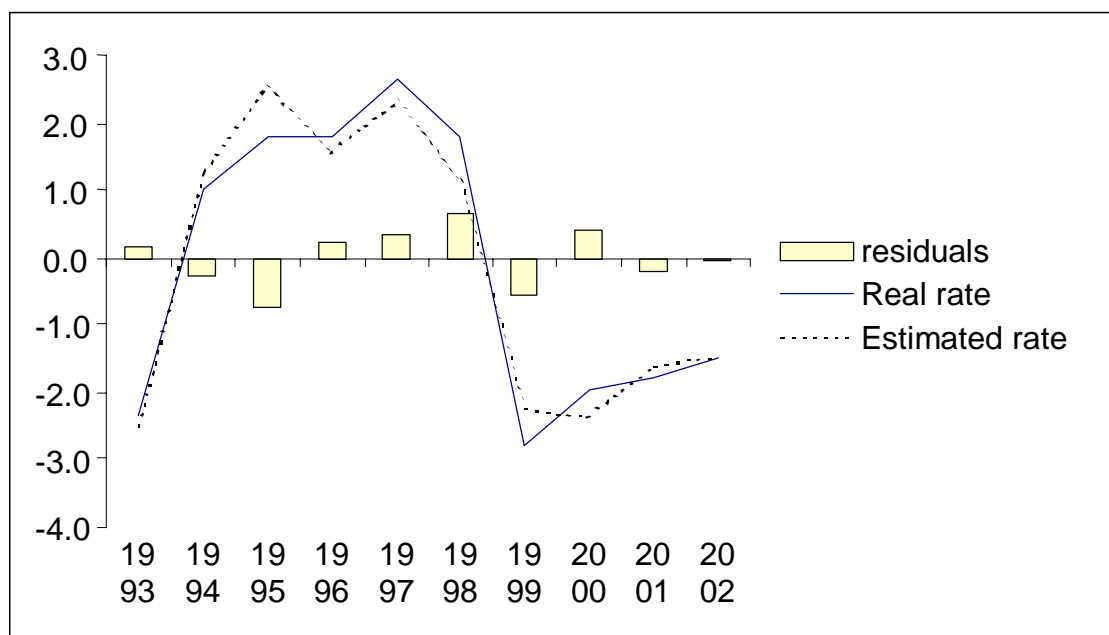
<sup>10</sup> When GDP elasticity of the demand for labour is close to unity, the economic growth rate, which does not result in employment growth is identical to the social labour productivity growth rate.

<sup>11</sup> The explanatory variable in the equation is the GVA growth rate (gross value added).



The parameters' estimates (statistically significant at the level below 0.1%, ratio  $R^2=0.944$  adjusted by the number of the degrees of freedom) indicate a strong reaction of the employment growth rate to each increase/ fall in the GDP growth rate by 1 percentage point. With other conditions unchanged, the working population growth rate rises/ drops accordingly by 0.7 percentage point. Employment starts rising only when the GDP growth rate exceeds 3.1% (employment growth rate is positive).

Fig. 5 shows that the parameters of the estimated equation are able to map the impact of a slower economic growth rate in the period 2001 – 2002 on the fall in labour demand.



**Fig. 5 Results of the estimation of an equation determining employment growth rate (E.), annual data from the period 1993 – 2002.**

What is left to explain is why, with an average GVA growth rate in the period 1993 – 2002, which amounted to 4.1%, the average annual employment loss amounted to  $-0.1\%$ , although, according to the equation, employment should have been growing at a rate of  $0.7\%$ .

The reason is the increase in labour productivity, achieved by an abrupt reduction of employment. The sample covered three such periods: 1993 (the year which ended the period of employment reduction at the beginning of the transition) and the cuts in 1999 and 2000, mentioned before. These years have been singled out in the estimation process. It has been estimated that in each of those periods there was a fall in unemployment, which was

unrelated to the increase in GVA by additional 2.8 percentage points. To compensate this effect the GDP growth rate should have increased in those years by additional 4 percentage points to reach 7%.

Profound economic changes in Poland do not allow, however, for extrapolation of the results and the short time span covered by the sample makes the estimation of parameters very unstable. Inclusion or exclusion of one observation influences significantly their value.

### POLAND – QUARTERLY DATA

Increasing the number of observations thanks to switching to quarterly data does not help much. Tab. 2 shows that shortening the sample time in the period before 1998 results in reducing the estimate of the growth rate at which employment starts to grow. The estimates for samples starting in 1993 and 1994 and in 1995, 1996 and 1997 differ from each other, while they are similar within the same group of years. The sample starting in 1998 yields a different result than the samples starting in 1995, 1996 and 1997.

**Tab. 2 Estimation of the E. parameters on the basis of quarterly data for various sample times**

Period	Constant A	GDP elasticity of labour demand $\beta$	GDP growth rate resulting in employment growth ( $-\alpha/\beta$ )	Observed GDP growth rate in the sample time	Observed employment growth rate in the sample time
<i>Number of observations</i>	<i>T-student statistics value</i>	<i>adjusted R<sup>2</sup></i>			
93.1-01.4	-3.44	0.65	5.3	4.5	-0.5
36	-4.05	3.86	0.284		
94.1-01.4	-3.42	0.66	5.2	4.8	-0.3
32	-3.42	3.44	0.260		
95.1-01.4	-3.42	0.76	4.5	4.8	0.2
28	-5.24	6.18	0.579		
96.1-01.4	-3.45	0.77	4.5	4.5	0.0
24	-4.77	5.32	0.543		
97.1-01.4	-3.61	0.83	4.4	4.2	-0.2
20	-4.65	5.05	0.563		
98.1-01.4	-2.94	0.54	5.4	3.5	-1.1
16	-3.83	2.83	0.319		

Source: Author's own calculations on the basis of quarterly data on GDP and the number of the employed in the enterprise sector (GUS [Central Statistical Office] Statistical Bulletins)

## OECD COUNTRIES

The estimations of the same relation (E.) on the basis of longer sample time of over 30 years relating to OECD countries render more stable and more informative results.

Tab. 3 presents average economic growth rates for selected OECD countries in the period 1961 – 1994 and the parameters of the equation (E.) estimated on the basis of the data from the same period (the explained variable in the equations was employment growth rate)<sup>12</sup> To analyze the stability of parameters in the equation, the sample has been segmented into three sub-periods (1961-1970, 1971-1981, 1982-1994). The economic growth rate, not resulting in employment growth, which is presented in the table has been calculated as the average rate of the three sub-periods of the sample.

**Tab. 3 Comparison of the average GDP growth rate with the minimum GDP growth rate required to increase employment in selected OECD countries in the period 1961 – 1994.**

	Average GDP growth rate in the sample time	GDP growth rate at which employment increases ( $-\alpha/\beta$ )	GDP elasticity of labour demand $\beta$
Denmark	2.92	1.21	0.35
Germany	3.12	2.50	0.48
Spain	4.45	4.20	0.52
France	3.61	2.49	0.36
Ireland	4.22	3.10	0.31
Finland	3.34	3.64	0.56
Sweden	2.64	2.02	0.57
UK	2.34	2.09	0.43
EU-15	3.29	2.75	0.46
USA	3.04	0.41	0.70

*Sources: Author's own estimates on the basis of the Eurostat data*

In the equation estimated for 15 EU countries the following total estimates of parameters have been obtained:

<sup>12</sup> The estimation was carried out for all 15 EU member states and the US. The table shows the results for those countries for which the estimates of the parameters of the equation 1 were statistically significant (the significance level below 0.001)

$$\text{E. 2} \quad r_{\text{eu-15}} = -1.96 + 0.46 * r_{\text{GDP}} + 0.90 * u_{71-81} + 1.22 * u_{82-94}; \quad R^2 = 0.589$$

$$t\text{-stud} \quad -5.60 \quad 7.09 \quad 3.45 \quad 4.42$$

GDP elasticity of employment was relatively high in the EU member states<sup>13</sup> and amounted to 0.46. The minimum economic growth rate triggering employment growth was also high, although it was falling for subsequent sub-periods.

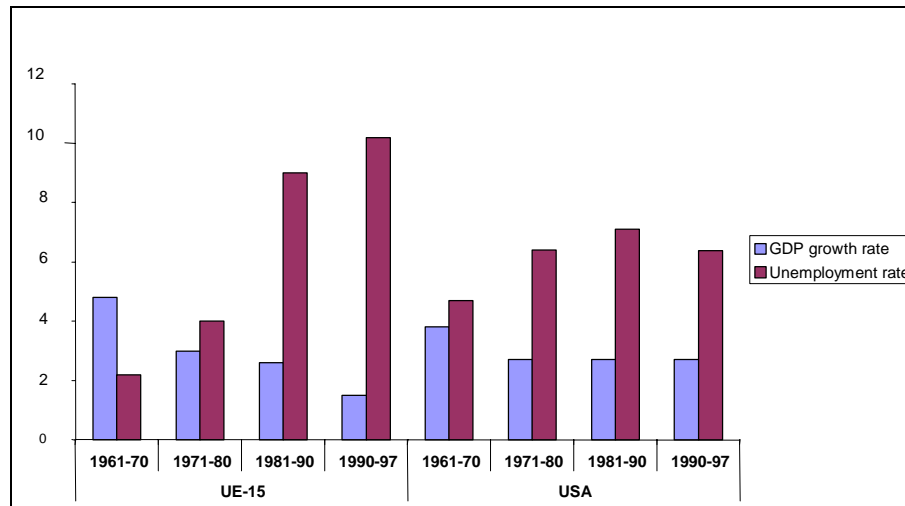
The equation (E. 2) indicates that in the 15 Member States of the EU in the period 1961 – 1994 the increase in the GDP growth rate by 1 percentage point led to an increase in the employment growth rate by 0.46. However, employment in the 15 member states of the EU increased only when the GDP growth rate exceeded 2.75% (this was the level of GDP growth rate required to trigger employment growth).

The significance of the estimates of the parameters with dummies for sub-periods, indicates that minimum economic growth rate required for employment growth is not constant and changes with the GDP. In the period 1961 – 1970 the 15 countries, which now form the European Union had an average economic growth rate of 4.8%. In this period the estimated economic growth rate which did not result in employment growth amounted to 4.3%. Employment growth proceeded therefore at a rate  $0.46 * (4.8\% - 4.3\%) = 0.23\%$ . In the subsequent period 1971 – 1981 the GDP growth rate in the 15 countries fell to 3%. The growth rate not resulting in employment growth decreased as well (to 2.3%). Even though the GDP growth rate was lower, the employment growth rate was higher compared with the 10-year period before and amounted to  $0.46 * (3\% - 2.3\%) = 0.32\%$ . Lastly, in the period between 1982 and 1994, when the GDP growth rate was only 2% the economic growth rate below 1.6% did not result in employment growth. Employment growth rate was lower as well and equaled  $0.46 * (2.0\% - 1.6\%) = 0.18\%$ .

Tab. 3 data shows that an average economic growth rate in the US, which was lower than in the economies of the 15 EU states was almost completely converted into employment growth. Firstly, in the American economy the economic growth rate which does not trigger employment growth was very low and amounted only to 0.4% (compared with 2.75% in EU-15 or more than 3% currently in Poland). What was high was GDP elasticity of labour

<sup>13</sup> Higher GDP elasticity of labour for Poland is due to the fact that the sample period covered sub-periods in which there was structural employment reduction which did not result from the GDP growth rate trends (at the beginning of the transition and in 1998 and 1999).

demand (0.7)<sup>14</sup>. As a result the economic growth rate was to a large extent correlated with the growth of labour demand, which was of vital importance for the unemployment rate.



**Fig. 6 Economic growth rate and the unemployment rate in EU-15 and USA.**

Fig. 6 compares GDP growth rate and the aggregate unemployment rate for 15 UE member states with GDP growth rate and the unemployment rate for USA in the period 1961 – 1997 (lighter bars stand for GDP growth rate while darker bars illustrate the unemployment rate).

With similar GDP growth rates for EU-15 and USA between 1961 and 1997 the unemployment rate in the US was significantly lower than in the EU member states.

It is worth looking more closely at the reasons behind such wide discrepancies between the employment (and unemployment) growth rates in the US and the EU. According to economic theory we should consider higher EU labour cost to labour productivity ratio as the root cause. Moreover, based on the OECD research, the American labour market is known to be the most flexible among all the OECD countries, while the labour markets in the EU states are highly regulated.<sup>15</sup>

<sup>14</sup> It should be stressed that the same level of GDP elasticity of employment growth (0.7) calculated on the basis of annual data for Poland is beneficial for an economy only when the GDP growth rate is high enough – above 3%.

<sup>15</sup> Among EU member states the least regulated labour markets exist in Anglo-Saxon countries. Among OECD countries ranked by the relative degree of labour market regulation the UK takes second position, followed by Ireland on the fifth. The leading EU countries: Germany and France are 21st and 20th, respectively. The bottom of the list is taken by Southern European states. USA heads the list of economies with most liberalized labour market. (OECD, 1999, tab. 2.5 p. 66)

*The relationship between employment and labour market characteristic*

Economic growth is an indispensable, though insufficient condition for effective curbing of unemployment. Whether economic growth is followed by an increase in labour demand is determined by, generally speaking, the cost of labour to cost of capital ratio compared with the productivity of each of those factors. Growing labour cost in relation to the cost of capital makes enterprises less willing to opt for labour-intensive manufacturing technologies. As a result production growth is generated by investment, which leads to gradual replacement of more expansive labour with cheaper capital. The process, visible on the macroeconomic scale, is manifested by quick growth of social productivity of labour (measured by the GDP level per worker), often at a rate quicker than GDP growth, which is accompanied by a slight increase or drop in employment. The effect of the process was described in the former section of the paper. However, forging a statistical link between this effect and the impact of labour cost on labour demand is rather problematic.

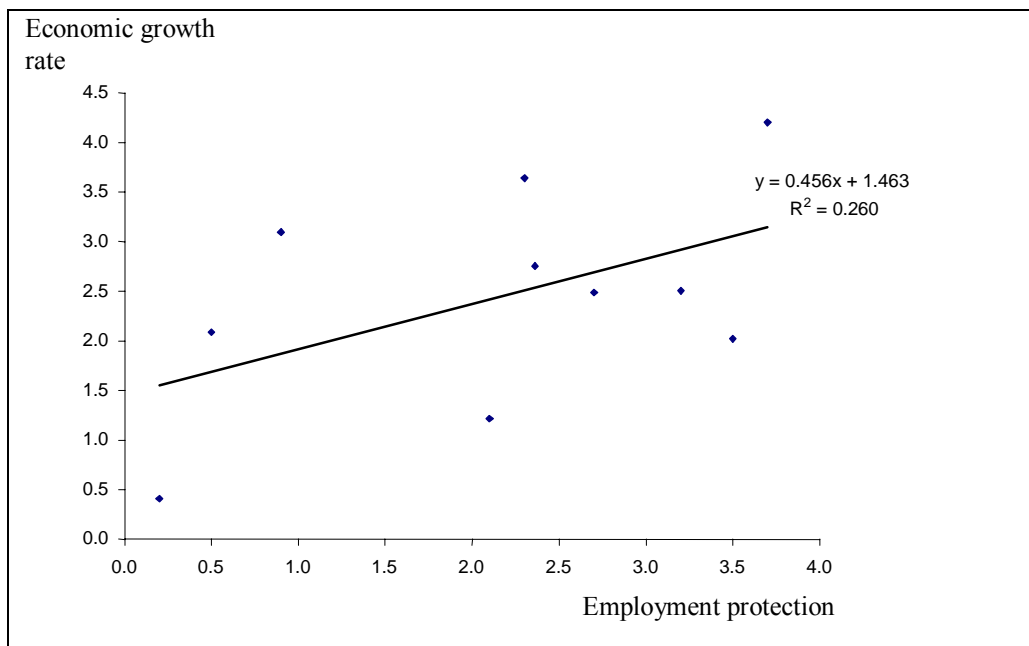
First of all, the labour cost which the employer (who takes the decision about hiring) has to calculate is not limited solely to labour and insurance premiums and contributions paid on behalf of the employee. It comprises also the additional costs, which are difficult to estimate, of complying with legal regulations on hiring and dismissing employees, which constitute jointly employee protection rules (against losing their job). Each regulation of this type produces certain effects, which affect the labour cost, which, however, cannot be easily quantified. How to calculate for example the costs of procedural difficulties in dismissing an idle employee or the decrease in the productivity of an employee during the notice period?

Secondly, the relationship between the cost of labour (including the degree of employment protection) and labour demand is theoretically obvious in the case of hired labour (employment). The theory looks at how changes in the labour cost impact employers' decisions whether to hire or not. However, when empirical studies for the whole economy are conducted, we usually use the "working population" category, which covers employers and the self-employed. The reason is that there is no sufficiently long run, comparable data on the output (GDP or gross value added) manufactured in the enterprise sector – outside the establishments of the self-employed and household agriculture.

Research shows (OECD, 1999) that one of the motives behind self-employment is the threat of unemployment (difficulty in finding a new job, which is related to the degree of employment protection). The reaction to changes in the degree of employment

protection differs for employment and self-employment. Thus, the effects of the changes in the degree of employment protection can be difficult to estimate when the study analyzes the total working population and unemployment.

The thesis on the relationship between the degree of employment protection (measured with EPL index) and labour demand can be illustrated with a correlogram of the EPL indices value and economic growth rates, which do not result in employment growth from Tab. 3 (Fig. 7).



**Fig. 7 The interdependence between GDP growth rate, which does not trigger employment growth, and the degree of employment protection in selected OECD countries**

The trend line presented in the graph illustrates the strength and direction of the dependence between the degree of employment protection and the minimum economic growth required to increase employment. Despite a low determination coefficient (limited sample), the parameters of the trend line, which are statistically significant can be interpreted in the following way. The higher the level of employment protection, the higher GDP growth rate is required to induce employment growth in the economy. Countries, in which labour protection level is lower by 1 point (grades from 0 to 6) can achieve employment growth at an economic growth rate lower by 0.5 percentage point.

It is a clear indication that lowering the level of employment protection (lowering the labour cost for the employer) allows to correlate economic growth with employment growth more strongly. When the economic growth rates drops by 0.5 point a stable

employment growth rate can be maintained by lowering the degree of labour market protection by 1 point.<sup>16</sup>

*The impact of real wage on employment in EU countries and the US*

From numerous labour demand hypotheses we have selected and decided to put to empirical test the hypothesis that the demand for output decomposes into factors of production (labour and capital) depending on the price ratio of both factors. The estimated equation derived on this basis for the rate of changes in labour-intensity of GDP (the opposite of social productivity of labour) can be formulated in the following way<sup>17</sup>:

$$\text{E. 3} \quad r_e - r_{\text{GDP}} = \alpha + \beta*(g_r - i_r) + \gamma*d_{73-74} + \delta*d_{\text{member}} + \varepsilon$$

where  $r_e$  and  $r_{\text{GDP}}$  are employment and GDP growth rates in the economy,  $g_r$  and  $i_r$  are real wage growth rate and the price of capital (real rate of interest), respectively;  $d$  represents dummies (zero-one variables) introduced to capture the effects of the first oil crisis (1973 – 1974) - ( $d_{73-74}$ ) and the membership of the European Union ( $d_{\text{member}}$ ),  $\varepsilon$  is the random element.

Parameters  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$  are structural parameters, to be interpreted as follows:

- $(-\alpha)$  is (positive) social labour productivity growth rate (when the real wage growth occurs at a rate corresponding to the real rate of interest). Since the equation assumes a priori marginal GDP elasticity of labour on the level of 1, the  $-\alpha$  parameter corresponds to (positive) GDP growth rate at which the employment growth rate amounts to zero<sup>18</sup>;

<sup>16</sup> Although the authors of the OECD report failed to demonstrate unambiguously the impact of the EPL measure and of individual elements of labour market regulation on the categories of total employment and unemployment in the OECD countries, we believe that it does not challenge the thesis that the degree of labour market regulation (or the degree of its flexibility) impacts considerably the employers' willingness to hire people. Positive statistical verification of the impact of the level of employment protection on employment and unemployment requires a large enough sample, in which various levels of restrictiveness of employment protection occur with a similar frequency. This condition has not been met for the OECD countries' sample, because the organization groups countries with highly regulated labour markets (EU countries). Observations for countries with a low degree of labour market regulation (USA, UK) have been regarded as atypical.

<sup>17</sup> Cf. European Economy 62, 1996 p. 36. The original equation did not have dummies and used a trend to capture the effects of technical progress. The estimation of equations 3 with the trends yielded worse statistical results due to colinearity of the variables. Accordingly, the trend was eliminated from the regression line.

<sup>18</sup> It is clear when the price ratio and the employment growth rate are set to zero.



- $(-\beta)$  is the elasticity of labour productivity with respect to the factors' price ratio. Real wage growth rate, which is higher by 1 point than the real interest rate results in an increase in labour productivity by  $-\beta$  point. Since GDP growth rate is approximately the sum of labour productivity growth rate and employment growth rate, an increase in the labour productivity growth rate by  $-\beta$  point is equivalent to a drop in the employment growth rate by  $\beta$  percentage point. Thus, the  $\beta$  parameter in the equation 3 measures the elasticity of the working population with respect to the price of labour to the price of capital ratio.
- $(-\gamma)$  is the constant adjustment (social labour productivity growth rate), which captures the effects of the first oil crisis – the variable  $d_{73-74}$  has been introduced to eliminate this effect from the estimation.
- $(-\delta)$  is a parameter, which measures the impact of the EU membership on the social labour productivity growth rate. The variable measuring the effects of membership (which equals 1 in the period following accession) has been introduced to adjust the value of parameter  $\alpha$  – upon membership in the EU the average social labour productivity growth rate amounts to  $-(\alpha+\delta)$ .

Real wage is defined as nominal compensation of employees per one employee, calculated with GDP deflator. The measure of the cost of capital is the real interest rate. The estimation has been carried out for the sample 1961 – 1994. Despite low determination coefficients, the estimates of the parameters presented here are statistically significant.

**ab. 4 The results of the estimation of the equation calculating the impact of real wages on employment in the period 1961 – 1994**

Country	Economic growth rate not inducing employment growth rate	Price ratio of the factors $g_t - i_t$	$d_{73-74}$	$d_{member}$	$R^2$
Germany	2.92	-0.42	2.42		0.551
France	3.05	-0.27	3.75		0.540
UK	2.53	-0.25	5.85		0.333
USA	1.42	-0.24	2.38		0.242
Ireland <sup>19</sup>	3.14	-0.31	3.30	0.40	0.150
Spain <sup>20</sup>	2.26	-0.56		1.05	0.726
Portugal	4.04	-0.28	8.85	1.78	0.419

*Source: own calculations*

The results of the estimation indicate that, after taking account of the effects of the measurable costs of labour (factors of production price ratio), the estimated economic growth rate which does not result in employment growth (which in this case is equal to the labour productivity growth rate)<sup>21</sup> is still significantly higher in the EU countries studied, than in the US.

If real wages were growing at a rate corresponding to the real rate of interest, the average labour productivity growth rate in France and Germany would amount to 3%, in the UK to 2.5% and in the US to 1.4%. The average GDP growth rate in those countries amounted to 3.1% and 3.6%, and 2.3% and 3%, respectively. On deducting labour productivity growth rate the economies in Germany, France and the UK did not have too much room left for an increase in labour demand. Indeed, employment growth in Germany, France and the United Kingdom in the period under study was 0.3%, 0.4% and 0.1%, while in the US it amounted to as much as 1.9%.

The reaction of labour-intensity of GDP to increasing real wage growth rate in relation to the real interest rate is negative. In France, the UK and the US the negative labour intensity growth rate fell by circa 0.3 point per each point of the real wage growth rate surplus over the real interest rate. With a certain GDP growth rate it means a drop in labour demand by the same amount. In the case of the German economy the reaction was slightly higher and amounted to 0.4 point.

<sup>19</sup> Only the  $g$  variable,<sub>t</sub>

<sup>20</sup> Only the  $g$  variable,<sub>t</sub>

When results are compared, it should be borne in mind that Germany had the highest level of the EPL index; in France it amounted to 2.7, in the UK to 0.5 and it reached the lowest value in the US (0.2). The values of the EPL index exhibit a similar pattern as the  $\alpha$  parameter – a high level of employment protection corresponds to a high labour intensity growth rate and vice versa.

The determination coefficient of the changes in labour – intensity of GDP depending on the wage to interest rate ratio is also related to the degree of employment protection (the best determination coefficient has been achieved for Germany and France and the lowest for the US). When the labour market is heavily regulated the employer has to take into account long-term consequences of the decision to hire another employee. Wage is an important factor in the decision, since other hiring costs (for example firing costs) are related to it. In the case of a heavily regulated labour market the cost of labour is the multiple of wage and thus its impact on employment is multiplied as well. When the degree of labour market regulation is low, the wage is practically the only cost incurred by the employer. The decision whether to hire an employee or not does not depend that much on wage fluctuations but rather on the changes in the demand for output.

The countries which joined the EU later (Ireland, Spain, Portugal) do not exhibit such a large degree of approximation in the reaction of labour demand to the changes in real wages in relation to interest rates as the more economically developed countries. In their case the determination coefficient is also correlated with the degree of employment protection, which is the highest for Portugal (4.1) and Spain (3.7) and the lowest in Ireland (0.9). On deduction of the effects of changes in wages, the country with the highest labour productivity growth rate (GDP increase without the increase in employment) was Portugal (4.1%), where in the sample period the GDP was growing at a rate of 4.6% and the employment remained practically unchanged (0.1% growth). The elasticity of labour intensity with respect to the wage to interest rate ratio in Portugal was close to the level witnessed in the developed EU countries.

In contrast, the hypothesis that accession to the EU exerted a significant impact on the labour market in the countries, which joined during the sample period, could not be positively verified. In the case of Portugal, on joining the EU labour demand went markedly up. The increase resulted from a growing global demand, caused by expanding markets. It was manifested by a significant increase in the investment growth rate (from

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<sup>21</sup> The equation assumes that GDP elasticity of labour equals 1.

-4% in the period 1980 – 1986 up to 11% between 1987 –1992), which, however, was not followed by the expected increase in domestic output, since the demand was increasingly satisfied by growing imports (Orłowski, 1998). Therefore, in our estimation the parameter at the zero-one variable was positive, which increased the growth rate of labour demand in relation to GDP growth rate (in response to growing demand the employers invested and took on employees, hoping for an increase in sales. However, the growth in demand was directed mainly towards import and not domestic output, which led to a drop in labour productivity and after some time to the necessary reduction in the employment growth rate).

In the case of Spain the average labour productivity growth rate, adjusted by the effects of changes in the factors of production price ratio was much lower than for Portugal or Ireland. In contrast, the reaction of labour productivity (labour-intensity of GDP) to changes in the price ratio was much higher. The effect of the membership in the EU was statistically insignificant.

To sum up: the hypothesis that labour costs correlate strongly with the demand for labour has been statistically confirmed in developed economies of the EU. Firstly, the increase in real wages in relation to interest rates drives up labour productivity growth rate by 0.25 to 0.3 point per each point of the difference between real wage growth rate and the real interest rate. Secondly, when there are no differences between real wage growth rate and the real interest rate, labour productivity growth rate is higher in those countries, in which employment protection is more restrictive. At a given GDP growth rate each increase in the labour productivity growth rate leads to a simultaneous drop in the demand for labour growth rate.

The correlation between labour costs and the demand for labour is not identical for all the economies which have joined the European Union. Ireland, which acceded to the EU at the earliest date and is more economically developed than Spain or Portugal has parameters, which are close to those in the developed economies of the EU. The structural parameters in Spain and Portugal are quite different, which can be explained by profound structural changes between the period before and after accession. Structural adjustments can blur the picture of the impact of accession on labour demand in the period after joining the Union. Generally speaking, in both countries labour demand rose directly on being granted membership. It was, however, a response to an increase in global demand. Having

deducted the impact of this factor on the labour market, no additional effect of membership has been detected.

## CONCLUSIONS

- ✓ Higher economic growth rate increases the employment growth rate. Marginal GDP elasticity of labour demand is positive. In developed market economies an increase in economic growth rate by 1 point, when other conditions remain unchanged, leads to a rise in labour demand growth rate by 0.3 to 0.7 point.
- ✓ When the economic growth rate is low labour demand goes down. Therefore, an increase in the economic growth rate results in employment growth only after some threshold economic growth rate is exceeded.
- ✓ Countries with high labour costs (costs of wages and of labour protection) achieve a higher economic growth rate by investment in assets to replace labour. This type of investment results in an increase in labour productivity growth rate (or, speaking more generally, an increase in economic growth rate, which is not accompanied by employment growth) and a simultaneous drop in labour demand growth rate (employment growth rate (see table 1)<sup>22</sup>. Even if this same economy entered a path of quicker economic growth there are no guarantees that it will induce higher employment growth rate. In particular, in the European Union the drop in the economic growth rate in the 70s compared with the 60s was accompanied by higher employment growth rate.
- ✓ The level of employment protection (labour cost) is positively correlated with the threshold economic growth rate. Once it is exceeded, employment starts to grow (in the countries with a higher level of labour protection employment growth occurs at higher economic growth rates).
- ✓ In the developed economies of the EU there is a strong link between the real wage and the demand for labour (an increase in real wages leads to a fall in labour demand). Firstly, an increase in real wages in relation to interest rates results in an increase in labour productivity growth rate by 0.25 to 0.3 point for each point of the difference

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<sup>22</sup> This mechanism is operative in the short-term as well. When the level of labour protection is high, a fall in the demand for output (GDP) does not entail employment reduction (due to high firing costs) and an increase in the demand for output does not result in employment growth (it is more profitable to maintain production capacity reserves, which are utilized in the case of an increase in demand). We see therefore labour productivity volatility per employee, which is positively correlated with production growth and a stable employment level.

between real wage growth rate and the real interest rate. Secondly, when there are no differences between real wage growth rate and the real interest rate, labour productivity growth rate is higher in those countries, in which employment protection is more restrictive<sup>23</sup>. At a given GDP growth rate each increase in labour productivity growth rate leads to a simultaneous drop in the demand for labour growth rate.

- ✓ In the economies, which joined the EU in the second wave of enlargement the link between labour cost (real wages) and the demand for labour is not identical. It is also difficult to assess to what extent the very fact of accession has changed the reaction of labour demand to an increase in labour costs. Ireland, which was the first to join in the group, and is more economically developed than Spain or Portugal has parameters, which are close to those in developed economies of the EU. The structural parameters in Spain and Portugal are quite different, which can be explained by profound structural changes between the period before and after accession. Structural adjustments can blur the picture of the impact of accession on labour demand in the period after joining the Union. Generally speaking, in both countries the demand for labour rose directly on being granted membership. It was, however, a response to an increase in global demand. Having deducted the impact of this factor on the labour market, no additional effect of membership has been detected.

A more general comment to conclude the paper. The inevitable processes of “catching up on labour productivity”, restructuring and reducing employment are believed to increase the efficiency of the economy, lay the foundations for boosting competitiveness in various industries, but are also held to reduce labour demand. At a given GDP growth rate a high labour productivity growth rate means a lower labour demand growth rate. This statement is of a static and short-term nature. High labour productivity growth, which exceeds the growth of production costs and in particular of labour costs increase the competitiveness of the economy. When competitiveness is rising, foreign and domestic demand for domestic goods and services is on the increase as well. Thus, GDP rises as well, which leads to an increase in labour demand. Growing competitiveness attracts more foreign capital, which is conducive to boosting production capacity, which in turn means job creation. As a dynamic process, the relation of GDP  $\Rightarrow$  labour demand is influenced by the relation of the costs of labour  $\Rightarrow$  labour productivity, which is determined to a large extent by economic policy. Generally speaking, it is not about driving the labour costs down or slow down their growth rate – it cannot be done when Poland aspires to join the European Union.

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<sup>23</sup> See last footnote..

Essentially, it all boils down to introducing such changes in the structure of labour costs, which, on the one hand, would constitute an incentive to increase labour productivity, and on the other hand would encourage employers to hire new people.

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