The analysis of regional earnings inequalities in Romania

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Abstract. *The priorities of regional development policies aim at reducing interregional and intraregional disparities by supporting the creation of some more integrated regional labour markets and by a better use of regional synergies in order to increase the investment attractiveness.*

Considering these aspects, the purpose of the study was to do an analysis in the developing regions of Romania which tried to identify the factors that influence earnings and earnings inequalities. We considered a panel analysis in which the determinant factors were the gross domestic product, foreign direct investment, the share of graduates from post-secondary and tertiary education of the total population of the region and inflation. These macroeconomic indicators play an important role in achieving the cohesion policy objectives to reduce disparities between the most developed regions and those with a lower level of development.

Keywords: earnings inequalities, regional disparities, earnings, panel date.

1. Introduction and literature

In the last years, the European countries seem to convey a greater importance to the territorial dimension of the policies promoted. The territorial (regional) dimension of cohesion was introduced in the Lisbon Treaty, and added to the social and economic dimension, thus becoming a political objective in the European Union.

The regional policy promoted by the European Union regarding cohesion and the territorial development refers mainly to job creation, competitiveness, economic growth, a higher quality of life and sustainable development. Clearly, the achievement of all these aspects contributes to the implementation of the Europe 2020 Strategy. Thus, the European Union, by its policies, aims at reducing the economic, social and territorial significant disparities which still exist between regions.

The territorial cohesion complements and enhances the process of economic and social cohesion promoted by the EU to support the reduction of intra and inter regional disparities. The progress achieved within the process of economic and social convergence is measured by a series of specific indicators, such as GDP, the volume of FDIs, wage level etc., which are defining indicators in reducing income disparities between regions. The regional cohesion policy is therefore a tool to promote economic and social convergence.

Recognizing the important role held by the territorial dimension within the development policies and strategies is reflected in the European documents issued. Thus, the Territorial Agenda of the European Union 2020 "Towards an inclusive, smart and sustainable Europe of diverse regions"[1], aims to establish the principles and to draw the strategic directions for the territorial development of the European Union and promotes the integration of the territorial dimension in sectoral policies at all levels of government.

The picture of economic and social disparities in the EU is highly complex as it reveals major differences in development between countries and between regions within a country. Thus we can say that, although in most countries regional disparities are at similar levels relatively speaking, the situation is much more difficult in countries where the GDP/capita is substantially below the EU average; in these countries even the most developed regions have a low level of development compared with the EU average. This situation also applies in the case of Romania, and therefore an analysis on earnings and territorial earnings inequalities helps identify the factors that may help achieve the regional convergence objectives.

In the eight development regions of Romania there is still a risk of deepening economic and social disparities because of factors such as: the lack of basic conditions to attract investors, and especially foreign investors; the insufficiently qualified workforce; the strong dependence on a limited number of economic sectors with low added value etc. It is obvious that the current and the potential economic and social problems are different from one region to another, which requires a targeted approach, adapted to the needs in each region, especially targeting the sectors that have a higher potential of growth.

In the models that assume a free labour market and costless labour mobility, the equilibrium is reached when wages adjust to the level where labour supply equals labour demand. In such models, wages of workers with the same characteristics converge on the labour market, regardless of infrastructure or capital differences between regions. This convergence occurs after equalizing marginal productivity. In this case, differences in inter-regional earnings reflect differences in labour productivity.

When the restrictive assumptions of a perfect market are relaxed, other explanations can be mentioned for the earnings disparities between regions. First, labour mobility may be hampered by the relocation costs, search and information costs or disutility felt at leaving home and moving to a new environment. For low development levels, higher mobility costs were observed when the density of non-agricultural activity is low and the infrastructure is underdeveloped (Park, 2008).

The literature indicated several explanations for the international phenomenon of increasing wage inequality. At the macroeconomic level, the most important factors proposed and investigated in empirical studies are: international trade, globalization, the shift from production activities to services, technological progress and increasing female participation in the labour market. At the microeconomic level, the main factors considered are increasing demand for education and skills and increase the returns of these factors. In addition, some institutional factors related to labour market flexibility have been examined, like the decline in unionization, the minimum wage and the unemployment benefits (Monastiriotis, 2002).

Empirical studies designed mostly for China concluded that the main determinants of inter-regional earnings inequality are: GDP per capita, the share of industry, unequal accumulation of domestic or foreign capital and the degree of urbanization (Candelaria et al., 2013).

The theory states that inequality coexists with economic growth. From the utilitarian perspective, inequality should exist along with economic growth, in order to maximize social welfare. This opinion is in contradiction with the

egalitarian view which states that all members of the society should have equal access to economic resources. Most empirical research addressing the inequality – economic growth relationship either analyse the impact of inequality on economic growth or the impact of various socio-economic variables on inequality (Fallah and Partridge, 2007).

Economic growth may have a negative impact on wage inequality as growth is often positively associated with higher investment, higher employment generating processes and, therefore, with increased access to jobs and wages for a greater number of people. The magnitude of the impact may vary between regions for many reasons. For example, the regions with higher density of urban population are associated with greater competition and therefore less access to certain jobs. Also, these regions are more attractive for migrants/immigrants, which, especially the low-skilled ones are willing to accept lower paid jobs and reduce the access to jobs for locals. Those with a higher level of education will be drawn to the more developed regions, which offer more opportunities and more jobs requiring a high level of training which, of course, are better paid (Majumdar and Partridge, 2009).

Among the results of the empirical studies on the impact of economic growth on wage inequality we can mention those of Bartik (1994), which states that economic growth disproportionately benefits less skilled workers, which reduces wage inequality. Moreover, Pardo-Beltran (2002) argues that economic growth negatively affects the earnings inequality and this effect is nonlinear, results also sustained by García-Penalosa and Turnovsky (2006) in the context of an endogenous growth model.

Many researchers have examined foreign direct investment (FDI) as one of the causes of wage inequality. Although FDI seems to be good for development (positive correlations were found between FDI and GDP, productivity or wages), not all categories of workers gain from them in the same extent. The reasons for this include: FDI induces technological changes that require specific skills; it can be located only in certain sectors, mostly in those requiring higher qualifications; and it provides training to skilled workers more than to unskilled workers (Te Velde, 2003).

A review of the empirical studies at micro and macro level show that, at the minimum, the foreign direct investment perpetuate inequalities, although most studies conclude that FDI emphasizes them. Most evidence on the relationship between FDI and earnings inequality is for developed countries. Figini and Gorg (1999) concluded that FDI has led to increased employee skills and greater dispersion of wages in Ireland in the period 1979-1995; Taylor and Driffield (2000) found a significant impact of foreign direct investment on the dispersion of

wages in the UK; while Te Velde (2001) observed an increase in wages of workers in the sectors which require mainly skilled workers.

For the developing countries from Latin America, Feenstra and Hanson (1995) found that foreign direct investment increased the relative demand for skilled workers in manufacturing in the period 1975-1998. In some regions, FDI accounted for more than 50% of the increase in the labour wage share.

Te Velde and Morrissey (2002) studied the effects of foreign direct investment on wages and wage inequality in five East Asian countries (Korea, Singapore, Hong Kong, Thailand and the Philippines) and found that FDI increased wage inequality in Thailand. They also found that FDI leads to an increase of wages for both skilled and unskilled workers.

2. Descriptive analysis

In this paper we used annual data for the period 2001-2011 on the 8 regions of Romania. The variables used were the foreign direct investment, the gross domestic product and the share of post-secondary and tertiary graduates of the total population of the region. The data on GDP, earnings and graduates were collected from the database of the National Institute of Statistics, while the FDI was obtained from the National Trade Register Office.

Both earnings[2] and investments were deflated by the consumer price index (expressed in 2000 prices), while GDP was deflated by the GDP deflator (in prices of the previous year). The period investigated was imposed by the fact that foreign direct investment has not been found before 2001, while the data on graduates stopped in 2011.

The earnings (expressed in 2000 prices) in the 8 regions of Romania are represented in Figure 1. We chose to represent only four years: 2000, 2004, 2008 and 2012 in order to be easier to follow the trend. Thus one can easily notice that in all regions earnings increased until 2008, so that later recording decreases in the real value (albeit nominal earnings have continued to grow). In most regions the earnings in 2012 was more than 100% higher than in 2000 (in the Bucharest-Ilfov, the increase was of 124%), the only exceptions being the South-East and South-West regions where the increases were of about 84%. However, earnings were lower in 2012 than in 2008, when Romania not yet started experiencing the effects of the economic and financial crisis. The smallest reductions (in 2012 as compared to 2008) occurred in the West and Bucharest-Ilfov regions (below 2%) and the highest was recorded in the North-East region (11%). However, for most regions the minimum was recorded in 2011.

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Figure 1. *The real gross average monthly earnings*
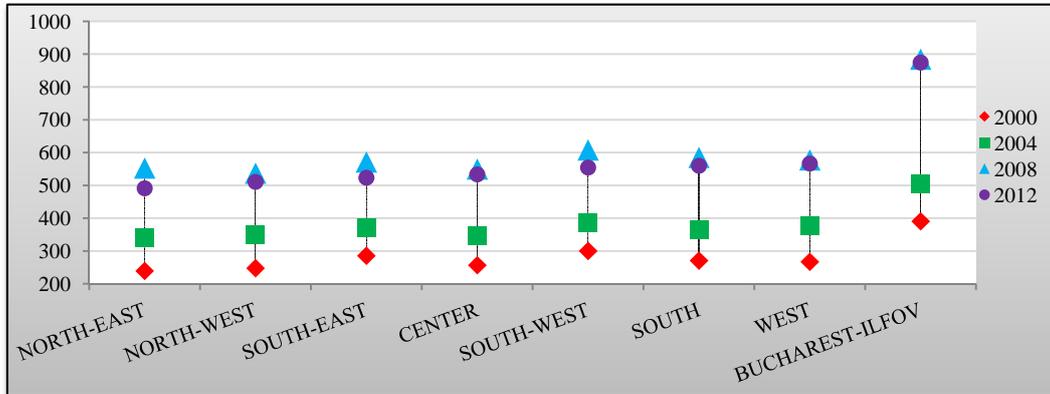
In terms of the graduates of post-secondary and tertiary education, their number increased in all regions until 2007 and then declined. In regions where the increases were not substantial, nor the reductions were not pronounced.

Figure 2. *Graduates of post-secondary and tertiary education*
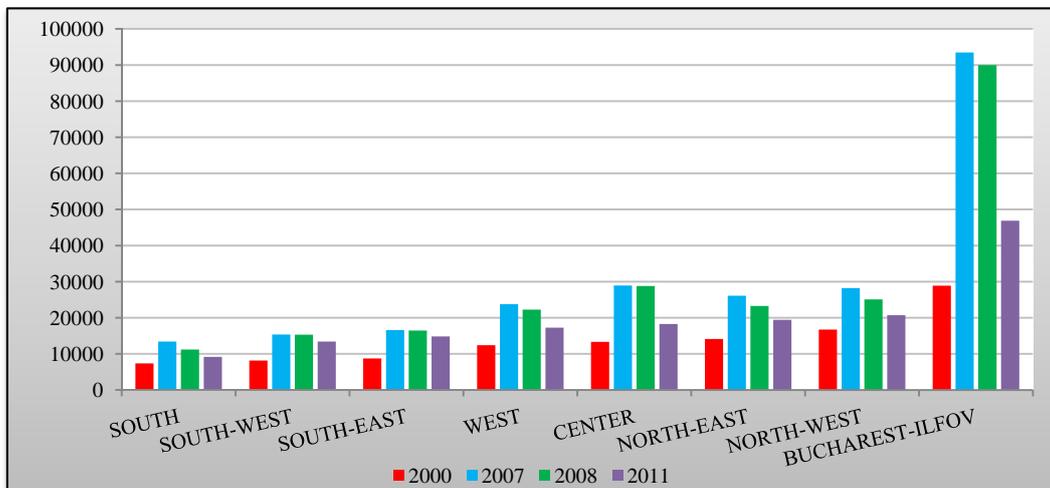
However, in regions such as Centre or Bucharest-Ilfov, where in 2007 there were over 100% more graduates than in 2000, the decrease of their number was higher (over 36%). Yet, most graduates in 2012 are still registered in the capital region (both in number and as a share of total population).

Figure 3. *The real gross domestic product*
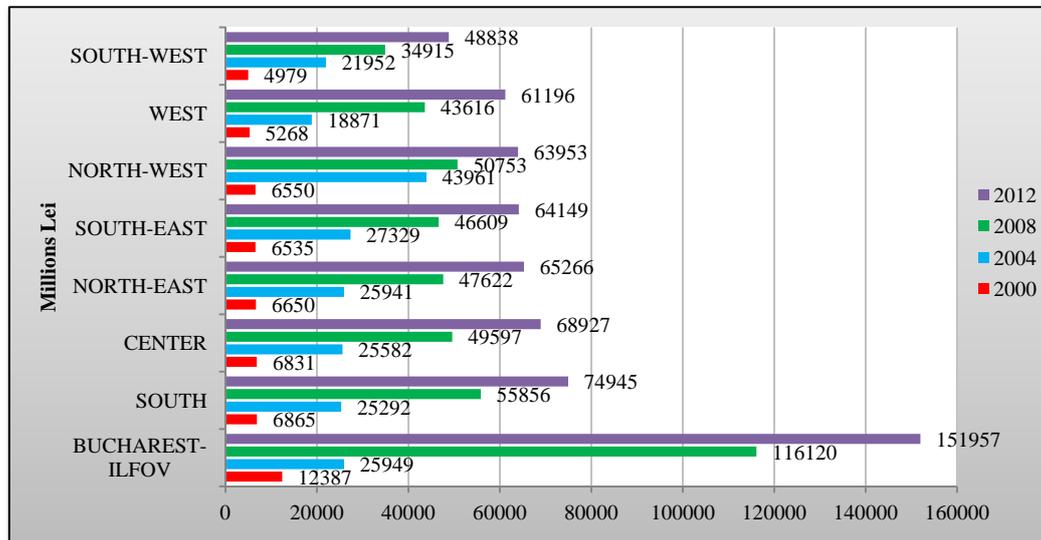
The region that contributes most to the gross domestic product is Bucharest-Ilfov, followed by the South region. If we look at the GDP per capita, the second is the West region and not the South. Regarding the evolution in the analysed period, in nominal terms, regional GDP grew at least 6 times (the highest increase occurred for the Bucharest-Ilfov region and the lowest for North-West region).

The largest increases (year to year) were recorded in the period 2001-2004, with increases even higher than 50%. For example, in 2001 the largest increase in GDP was of 60.2% in the Northeast region and the lowest of 43.6% for the Bucharest-Ilfov region. After 2004, the GDP growth was not as pronounced, falling below 25% by 2008 (the only exception is the increase from 2005 in the capital region - 32.3%). The period 2008-2012 was a time of crisis, especially felt in 2010, when in the South region the GDP growth was negative (0.2%). In 2012, the GDP of the regions began to grow at rates similar to those before 2009, indicating an improvement in the economic environment.

Figure 4. *Foreign direct investments*
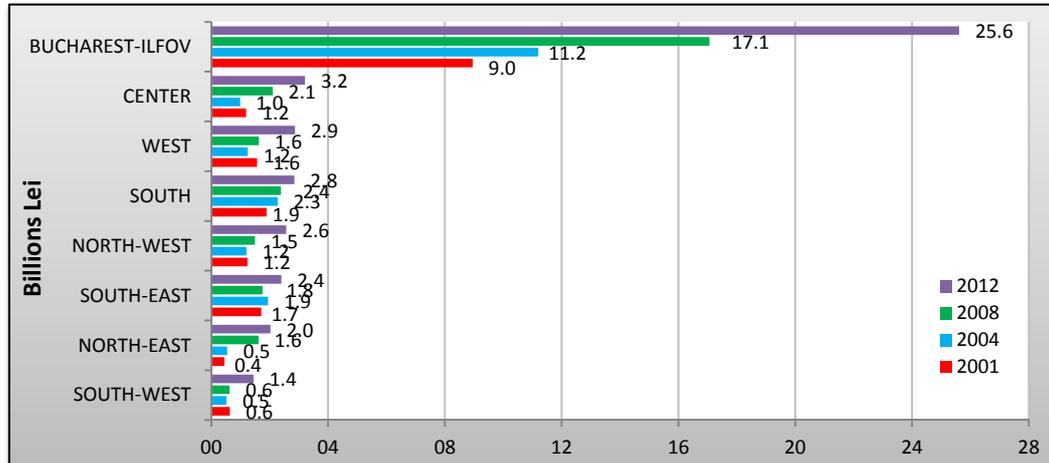
a. Foreign direct investments, regional level (2000=100)
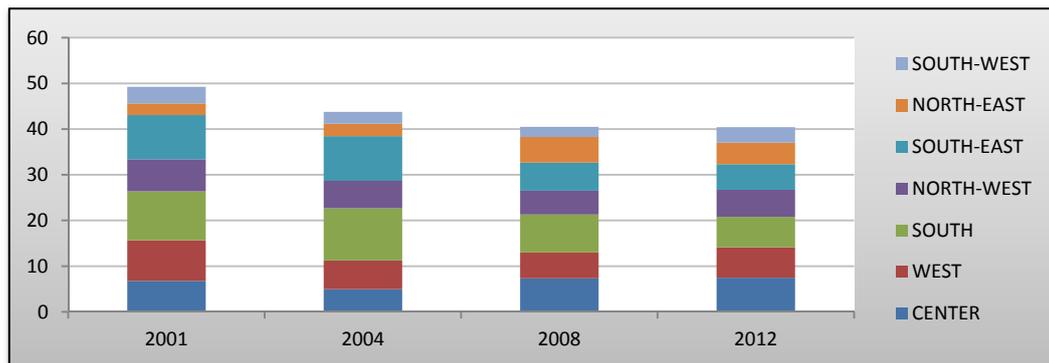
b. Foreign direct investments, share of regions in total (Bucharest-Ilfov region was excluded)

The foreign direct investment in Romania increased from year to year, in the analysed period. Moreover, in five of the regions these increases were more than 100% (in the Northeast region the increase was of 353%). The smallest increases occurred in South-East (40%), South (51%) and West (83%). In the year 2012, most investment went into Bucharest-Ilfov region, followed by the Central region.

Regarding the share of each region in the total FDI brought into Romania, as expected, the Bucharest-Ilfov region represents over 50% (reaching almost 60% in 2012). The following rank is held by the central region (7.5%), while the smallest share is represented by the South-West region. It is worth noting the fact that while the growth in the period under review for the West region was among the lowest, the amount of FDI entered in 2012 in this region represents 6.7% of total investment in 2012 (immediately after the central region).

3. Methodology and econometric analysis

We considered the estimation of two econometric models in order to analyse the impact of different variables on earnings inequality, considering as dependent variable the monthly gross earnings and the Gini index at regional level. Although initially we considered a large number of factors, after several estimations we obtained that for the earnings inequality (*ineq*) only the foreign direct investment (*fdi*) and gross domestic product (*gdp*) have a significant statistically influence, while the earnings (*earn*) are influenced by FDI, GDP, the share of post-secondary and tertiary graduates of the total population in the region (*grad*) and inflation rate (*ir*).

Regarding the Gini index, for each of the Romanian regions we calculated an index by considering the earnings at county level, corresponding to each region. The main purpose was to determine the wage inequality within regions and subsequently use these Gini indices as independent variable in an econometric model built to assess inter-regional earnings disparities in Romania. The Gini index measures the deviation of an individual's income distribution from a perfect egalitarian one. This index ranges between zero and one, where 0 indicates a perfect equitable income distribution across the individuals and 1 means that only one individual receives all the income. The Gini index calculated from a sample is a statistic, therefore it is recommended to report its standard error or confidence intervals, in order to provide some information regarding the measure of bias. These can be calculated using bootstrap techniques (Karagiannis and Kovacevic, 2000).

We decided to estimate a panel data based on the 8 regions of Romania and a period of 11 years. All the estimations were made in Stata. For this particular case we considered the individual effects as fixed, allowing them to be correlated with the explanatory variables and providing the opportunity to control the unobservable effects specific to each region. After this decision, which has also been tested through the Hausman test and indicating the use of a fixed effects panel data model, we tested the hypothesis of the model errors. Thus, we applied tests for autocorrelation and homoscedasticity (Drucker, 2003, Baum, 2001), obtaining that errors are indeed heteroscedastic and autocorrelated. Considering this result it was necessary to obtain consistent estimators by applying robust estimates.

$$\ln\_earn_{it} = -15.1784 + 0.0742 * \ln\_fdi_{it} + 0.0850 * \ln\_grad_{it} + 0.842 * \ln\_gdp_{it} + 0.0643 * ir_{it}$$

$$(0.86)^* \qquad (0.02)^* \qquad\qquad (0.03)^{**} \qquad\qquad (0.05)^* \qquad\qquad (0.02)^{**}$$

where between brackets are the robust standard errors and the *, **, *** stands for 1%, 5% and 10% significance.

The variable that has the greatest influence on the dynamics of earnings is the GDP (associated coefficient 0.842), consistent with the economic literature.

Thus, it is natural that the level of earnings is correlated with the macroeconomic outcomes in a country, as the GDP growth provides conditions for the growth of all incomes of the population (including earnings).

Regarding the influence of the tertiary education, the result is normal as a sign (positive), even if it has a low associated coefficient (0.0850). Nevertheless, it is significant that this coefficient is higher than that associated with FDI (0.0742) in a period of analysis in which Romania experienced an investment boom. This means that the contribution of human capital exceeds the contribution of foreign technology in support of earnings increases. The positive influence of the FDI on earnings dynamics is natural since the jobs created by these investments are better paid than the national average (the contribution of superior technology and the management quality support higher levels of labour productivity).

Even though inflation has the least influence (associated coefficient 0.0643), the direction of the correlation indicates that inflationary pressures (higher in the first part of the analysed period) supported earnings increases. The main reason is that most of the time interval for the estimated model includes the boom period (inflationary output gap). It is possible that in the analysed interval there could have occurred small salary adjustments to compensate for eroding the purchasing power of earnings due to the high level of inflation in the first part of the interval.

$$\ln\_ineq_{it} = -1.8383 - 0.1729*\ln\_gdp_{it} + 0.1327*\ln\_fdi_{it}$$

$$\quad\quad\quad (0.57)** \quad\quad (0.05)** \quad\quad\quad\quad (0.04)**$$

where between brackets are the robust standard errors and the *, **, *** stands for 1%, 5% and 10% significance.

Analysing the model describing the dynamics of earnings inequalities, we note that once again, the GDP has the greatest influence (associated coefficient -0.1729). But the most important result is given by the sign of the coefficient associated with GDP which shows that earnings inequalities are on the right side of a Kuznets curve, which is a situation specific to developed countries. This shows that the performance improvements in economic growth create conditions for reducing earnings inequality. The intensity of the FDI influence is close to that of the GDP (associated coefficient 0.1327), which is a normal result given that jobs in foreign-owned enterprises are better paid.

The result is also confirmed by the higher value of the coefficient associated with FDI in this model compared to that in the earnings dynamics equation. This means that the FDI flow first supports earnings differences (supported in return by the positive differences of technology and management), but in time, it also supports the increases in the general level of earnings.

4. Conclusions

Following the panel estimates made on the development regions in Romania we noticed that the greatest influence, positively speaking, on the level of earnings is exercised by the GDP, which is a normal economic influence since it shows a correlation between macroeconomic outcomes and earnings. All other variables included in the model have also a positive influence on earnings – FDI and people with a higher level of education indicate that high-skilled labour force is better paid, especially by foreign investors who need specialists in various fields of activity. The influence of the inflation rate shows that inflationary pressures sustained earnings increases.

The GDP has a negative impact on earnings inequalities, showing that these inequalities are on the right side of a Kuznets curve, which to some extent indicates that the performance improvements in the economic growth create conditions for reducing earnings inequalities. FDI has a positive influence showing once again that jobs in foreign-owned companies are better paid.

In order to reduce income inequalities and promote social inclusion it is important to promote policies aimed at increasing and improving the employment structure, especially the employment of those who have difficulties in finding a job, to boost labour productivity and the employment of young people on the labour market. For Romania an important element in reducing poverty and inequalities is the development of agriculture, and rural economy in general but also the development of the regions where the income is low, the stimulation of investment, especially FDI. The improvement of education and professional training and the chance to equal opportunities to participate in education and reduce the rates of school dropout are elements that can contribute to reducing inequalities in the long term.

Acknowledgements

Notes

[1] The Territorial Agenda 2020 was adopted at the Informal Meeting of Ministers responsible for Spatial Planning and Territorial Development held in Hungary on May 19, 2011
http://www.minind.ro/cctc_2014_2020/dse/Agenda_teritoriala_a_UE_2020.pdf

[2] For the econometric analysis the earnings are expressed in nominal terms, because we were also interested in the impact of inflation on them.

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