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FINANCIALIZATION AND INCOME INEQUALITY IN SELECTED EUROPEAN COUNTRIES, 2004-2013

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Abstract

The article examines the impact of financialization on income inequality between 2004 and 2013, through a panel analysis of seven European countries. Moreover, it attempts to examine differences in the perception of the phenomenon between the selected European countries belonging to the G-7 and countries from Central and Eastern Europe. The results demonstrate the existence of individual effects, which means that the level of inequality under examination is influenced predominantly by country-specific factors. The most significant correlation is noticeable between the level of unemployment and the degree of income inequality. An increase in unemployment is accompanied by a rise in the disproportions in the level of income that individual citizens have at their disposal whereas a decrease in the unemployment level contributes to an improvement of the GINI coefficient. Simultaneously, the results confirm the existence of significant correlations between the level of the GINI coefficient and such financialization indicators as the share of employment in finance in total employment and the contribution of the financial sector to total value added creation. The most prominent dependency was discovered when a constructed synthetic indicator was adopted as an indicator of financialization. At the same time, analysis of the synthetic country financialization indicator points to a conclusion that the level of financialization is higher in European countries belonging to the G-7 (especially Great Britain) than in countries from Central and Eastern Europe.

JEL classification: E02, E44, O15
Keywords: financialization, inequality, the Gini coefficient, income distribution, Central and Eastern European countries

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Introduction

In recent years financialization has become a collective term for developments that highlight the increasing relevance of finance not only for society and the economy as a whole but also for phenomena related to different actors and concepts for particular entities. Epstein (2006, p. 3) defined financialization as follows: "Financialization means the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies." The changes brought forward by the financial sector affect the structure of the economy, economic policy and the behaviour of corporations (Palley, 2013).

Financialization has been conceptualized in a variety of ways (Flaherty, 2015, p. 418), such as the diversification of firms into financial activities away from core real economy pursuits (Krippner, 2005), the growing use of securitization and tradable financial instruments as distributors of risk (Movitz & Allvin, 2014), a realignment of corporate strategies in favour of profiteering and cost saving (Thompson, 2003, 2013) and the use of credit to shore up consumption under real wage stagnation (Guttman, 2008; Stockhammer, 2012; Kus, 2012; Tomaskovic-Devey & Lin, 2013; Van der Zwan, 2014).

Research on financialization is focused on evaluation of the causes and sources of this phenomenon, its intensity or scale as well as its consequences for the effective operation, development, and stability of the global economy. Review of worldwide literature reveals that one of the fields of interest is evaluation of the impact of this phenomenon on the degree of economic and income inequality. More and more commonly, the existence of a relationship between financialization and rising inequality is brought to our attention. Essentially, the claim that financialization and increasing inequalities affect each other on many levels no longer raises any doubts. Currently, the channels of influence and factors characterizing these correlations are being sought. We have decided to examine if and to what extent the level of inequality measured by the GINI coefficient is influenced by the variables which we have selected as financialization indicators, and the variables not included to this group (Table 1).

In this study we have taken into account data from seven countries, and divided them into two sets – the representatives of the G-7 (Great Britain, Germany, Italy, and France) and countries from Central and Eastern Europe (Poland, the Czech Republic, and Hungary). Our desire was to find the possible differences between these economies on various levels of development.

Financialization and Income Inequality. Literature Review

Economists are divided on just how to define and measure inequality. As Kennickell wrote (2009, p. 1) wrote, inequality may seem a simple term, but operationally it may mean many different things, depending on the point of view. This economic and social phenomenon can be described by income, consumption, or wealth. One of the most-cited indicators of inequality is income. For instance, in a recent report, the Organization for Economic Cooperation and Development (OECD, 2015) noted that "in OECD countries, the richest 10% of the population earn 9.6 times the income of the poorest 10%." The U.S. Census Bureau (2015) publishes two measures of income

Table 1: Variables used in the course of the research

Dependent variable	Independent variables connected with financialization	Independent variables not connected with financialization
GINI coefficient	Value Added in Finance as a Percentage of Total Value Added Market Capitalization as a Share of GDP Employment in Finance as a Share of Total Employment	Unemployment Rate GDP Growth Rate Female Unemployment Rate Average Wage Growth Rate Social Expenditure as a Share of GDP Current Account Balance Personal Remittances as a Share of GDP
	Private Debt as a Share of GDP	

Source: Own study

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inequality. According to the most recent report, the top 5% of households received 21.8% of aggregate income in 2014, while the bottom 60% received just 27.1%. The Census Bureau also reports the GINI coefficient, a summary statistic that measures the dispersion of incomes on a scale of zero (everyone has exactly the same income) to one (one person has all the income). The income GINI for the U.S. has been rising for decades. It was 0.362 in 1967 and 0.464 in 2014.

But according to some, income data have too many flaws to be the primary indicator of inequality. For one thing, many income inequality indicators use income before accounting for the impact of taxes and transfer payments, which act to reduce inequality. In addition, critics of the income-based approach note that an individual's (or household's) income can vary considerably over time, and may not reflect all available economic resources – such as credit availability, government assistance, or accumulated family wealth. They argue that consumption is a better indicator of economic well-being. Such studies typically find that consumption inequality is less than income inequality, though still significant. A 2012 study of the American Enterprise Institute, using data from the Consumer Expenditure Survey, found that the top 20% of U.S. households by income accounted for nearly 40% of total expenditures, while the bottom 20% accounted for less than 10% of expenditures.

A third way to look at economic inequality involves household wealth. People with great accumulated wealth may not receive much in the way of income; while people who earn a lot but also have high expenses may not consider themselves especially wealthy. Wealth inequality tends to be much higher than either income or consumption inequality, but it also tends to not vary as much over time.

Analyses of economic inequality are first of all based on the income inequality approach. The reasons for income inequality are predominantly seen as associated with: excessive globalization of national economies, the striving for economic growth, the level of unemployment, the power of influence of left-wing political parties on socio-economic policy, the scale of social public expenses, trade union power, female participation on the labour market, and the conditions of employment and remuneration. In the 21st century, the economic factors contributing to income inequality correlated with financialization are brought to our attention more and more commonly.

Epstein & Crotty (both in Epstein, 2006) were the first to link financialization and rising income inequality explicitly. Epstein (2006) suggested that financialization and neoliberalism squeezed the profits of non-financial corporations in which many find employment. The result of such pressures on profits was that wages have increased more slowly for workers than for top management in these firms (Crotty, 2006, p. 78). International competitive pressures curtailed price increases, intensifying the drive to cut labour costs as well (Milberg & Winkler, 2010). Palley (2007) noted a disconnect between significant increases in productivity of workers and stagnant compensation. He cited multiple reasons for the slow wage growth, including the erosion of unions, the decline in the real purchasing power of the minimum wage, the changes brought about by globalization, the growing demand for skilled as opposed to unskilled workers, and rising CEO pay.

Thus evaluations of financialization's influence on income inequality have started to accentuate the fact that the increase in the contribution of the financial sector to the economy and the decreasing contribution of the real sector to the formation of GDP causes a gradual fall in income earned by the lower middle class and salary-earning employees, while remunerations of the upper class simultaneously reach exceptionally high levels, which leads to the growth of income inequality. What is more, the transition from the real economy to one strongly concentrated on the financial sector also leads to a reduction in the power of influence exerted by trade unions and government policies as far as shaping remuneration is concerned. The dependency of non-financial corporation's on the financial sector causes an increase in importance of the role of shareholder value management and corporate governance which are intended to equate the interests of owners and managers, neutralize agency costs, and steer the decision-making process towards increasing profits over a short period. The owners' pressure on the constant rising of profits has encouraged executives to drastically reduce the costs of labour and introduce remuneration systems which make the managers' salaries dependent on income earned by the company. And so income inequality emerges as a consequence of stagnation of employees' wages and increases in managers' pay (Sjöberg, 2009). As Mishel and Gee (2012) put it, between 1995 and 2005 the average wage of CEOs in the USA increased from 38 times to 262 times more than the average wage of other employees. Thus financialization contributes to the increase in income

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and wealth of the most well-endowed social groups (Ratajczak, 2012), which leads to the emergence of the wealth effect as well. The problem, however, is that the propensity to consume, which usually decreases along with a drop in a wages, may limit the positive influence of financialization on the general level of prosperity and the pace of economic growth, which may cause numerous social conflicts.

Other contributors to the increasing income inequality connected with financialization, which are offered by the relevant literature, are: a rise in market capitalization and the level of rates of return achieved on the financial markets as well as state policies promoting the superior role of the financial sector within the framework of their strategies of long-term economic growth.

As it is written, financialization is an effect of neoliberal economy policy. Palley (2013) and Dunhaupt (2014) regard neoliberalism and financialization as two complementary concepts leading to and making possible the deregulation and liberalization of goods, capital and labour markets, thereby potentially contributing to the rise in income inequality, which is illustrated in Figure 1.

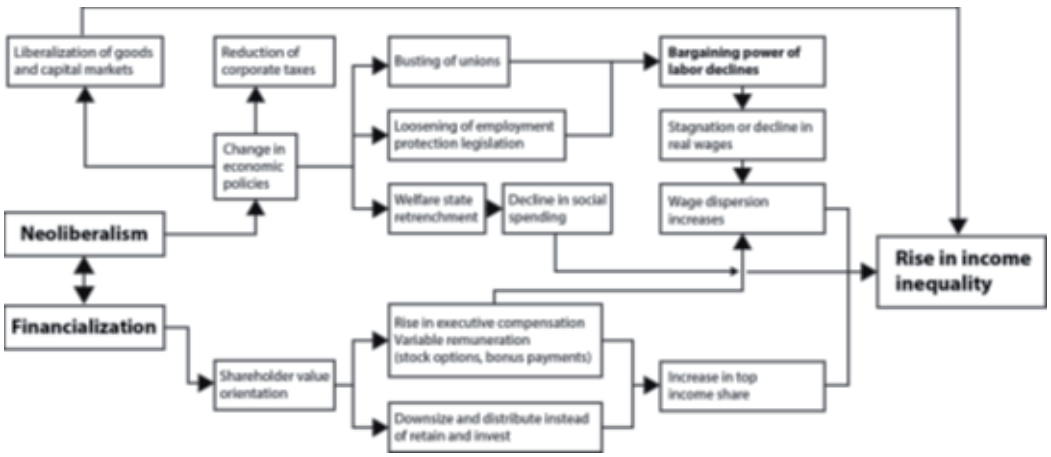
Empirical studies devoted to the selection of factors influencing the level of income inequality, dependent on the degree of financialization, most often employ linear (or less frequently non-linear) regression where the dependent variable is usually the GINI coefficient. Whereas the selected economic data, including information on the degree of financialization, serve as independent variables. Studies are carried out on a global scale as well as on groups of selected countries, or on an individual basis for a single country. The influence of financialization on income inequality was analysed, for instance, in the U.S. economy (Van Arnum & Naples, 2013; Tomaskovic-Devey & Lin, 2013; 2014) and France (Alvarez, 2015). Due to the limited length of the paper and subject of the article, we are presenting below the results of several empirical and interesting studies only for country groups.

Stockhammer (2009) was perhaps the first to explore the contribution of global financialization to the declining wage share of income for 22 high-income countries from 1979-2007. He found in several different specifications that the global financialization variable (defined as foreign assets and liabilities as a share of GDP) was statistically significant and negatively correlated with the wage share (Stockhammer, 2009, p. 45-46). In his preferred model, this global financial exposure variable was the single most significant one, explaining a 4.2% decline in the wage share (Stockhammer, 2009, p. 50).

Zalewski & Whalen (2010) also argued that financialization has contributed to increasing income inequality in 15 European countries, Canada, Japan, and the United States since the 1990s. They used the IMF index of the prominence of arm's length vs. relational finance (intermediation) in a country. That indicator and the GINI coefficient had simple cross-section correlations of 0.184 for 1995 and 0.254 in 2004 (Zalewski & Whalen, 2010, p. 765).

Charpe & Tobin (2011, p. 60) also studied the impact of this global financialization indicator on labour's share in 16 high-income countries from 1981-2005. Regression analysis confirmed that the wage share is negatively impacted by financial globalization when controlling for such factors as union density and trade openness.

Figure 1: Hypothesized contribution of financialization to income inequality



Source: Dunhaupt, 2014, p. 8

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Tomaskovic-Devey & Lin (2013) relied on panel data for 35 non-financial industries from 1970-1997 and 40 from 1998-2008 to calculate the decline in labour's share of income induced by financialization. Other significant repressors' included union density and college attainment. The two found that during the same period in which labour's share of income fell, compensation for top executives rose dramatically, owing to processes related to financialization, such as substituting financial investment for production and sales investment (Tomaskovic-Devey & Lin, 2013, p. 1299-1306).

Assa (2012) evaluated the effects of financialization on the rise of income inequality, reduction of the economic growth rate, and the increase in the unemployment rate in 34 OECD countries. As the independent variables two financialization indicators were used: value added in finance as a percentage of total value added and employment in finance as a share of total employment. The independent variables were: the GINI coefficient, the economic growth rate, and the unemployment rate. Panel research was carried out for the period 1970-2008. Assa (2012, p. 36) demonstrated that financialization of the OECD countries intensified. He observed that in 1970 only two OECD countries (France and Mexico) had an over 20% share of finance in total value added, and in 2008 there were already 28 countries that exceeded this value, which the researcher had considered a threshold. The process of financialization was the most intense in Luxembourg, Israel, France, the USA, Australia, and New Zealand, with more than 30% of total value added coming from the financial sector. A change in the employment rate in the financial sector over time confirmed the increase in the degree of financialization. At the end of 2008, employment in finance in 23 OECD countries exceeded 10% of the total employment, whereas in 1970 the rate of employment in the financial sector in all the countries under examination was below 10%. Ten OECD countries at least doubled the employment rate in finance. For instance in Poland and Finland, the increase was four-fold.

Assa (2012, p. 37-38) also demonstrated that the level of income inequality is positively and statistically significantly correlated with both the share of the financial sector in total value added as well as to employment in finance. Both variables influence the economic growth rate as well, although the correlations are negative and statistically insignificant in this case. In the end, both the independent variables exert a positive and statistically significant influence on the employment level.

Kus (2012, p. 477-495) published the findings of panel research concerning the same topic, which was conducted on highly developed countries. The aim of his empirical analysis was to demonstrate the degree of correlation between financialization and the GINI coefficient in a group of 20 OECD countries based on data from the period 1995-2007. The author showed that there was a strong correlation between an array of financialization indicators and income inequality. The degree of financialization was evaluated with three indicators: market capitalisation to GDP ratio, bank income before tax as a percent of GDP, and securities under bank assets. Additionally, the indicators served to create a financialization index which is the standardized average of these indicators. Other independent variables associated with inequality were: unemployment rate, female participation on the labour market, GDP growth rate, and social expenditure as a percentage of GDP.

The obtained results of estimation of the created models allowed Kus (2012) to draw the following conclusions:

1) All the variables employed in the empirical analysis, which describe the phenomenon of financialization, have a positive and statically significant influence on the emergence of income inequality. The capitalization to GDP ratio was of the least significance, whereas the increase in securities under bank assets was the most important.

2) From among other economic data traditionally treated as the main factors causing income inequality, unemployment rate exerted a statistically significant and positive influence (which is a natural phenomenon) and an increase in social expenditures as well as a rise in female employment rate caused the level of inequality to fall; whereas the influence of the economic growth rate on the level of income inequality turned out to be statically insignificant.

Dunhaupt (2014) investigated the impact of financialization and changes in corporate governance on income inequality for a sample of 13 OECD countries between 1980 and 2010. She analysed influence of the shareholder value orientation, power resources and the welfare state, and structural developments on income inequality. Shareholder value orientation was measured by two indicators, i.e. stock market capitalization as a share of GDP and dividend payments of non-financial corporation's related to their value added. Dunhaupt's

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(2014, p. 21-26) findings suggest that financialization – measured by stock market capitalization – has a positive and statistically significant effect on the GINI coefficient. Regarding the net dividend payments of non-financial corporations, she found that a higher dividend payout ratio increases the income inequality.

For power resources and the welfare state, Dunhaupt (2014, p. 18) used four variables: union density, left cabinet strength, unemployment rate and social spending. The results for power resources and the welfare state were as expected. Union density had a negative effect on income inequality. She also found that a higher share of unionization helps to reduce and transfer income inequality. For left government seats, she did not find a significant effect. As expected, unemployment rate showed a positive influence on inequality. Social spending showed a statistically significant and negative effect on income inequality. These findings support the commonly accepted view that higher social spending reduces income inequality.

Structural development was described in Dunhaupt's (2014) research by globalization, the technological changes, level of country development, female participation on the labour market, and the old age dependency ratio. Regarding globalization, she found a negative and statistically significant effect on the GINI coefficient. Trade openness and technological changes have a negative impact on income inequality as well. Moreover, she also found a negative effect of GDP growth per capita (level of country development) on the GINI coefficient. The female participation rate and the dependency ratio have a positive impact on income inequality.

Finally, using panel models of 14 OECD countries from 1990 to 2010, Flaherty (2015) argues that financialization influences top incomes through two principal domains: altering the balance of bargaining power between capital and labour, and through state regulatory controls and redistributive mechanisms. First, given the general responsiveness of top incomes to indicators of power resources linked to financialization, his results suggest that wealth concentration must be interpreted in terms of relative class-based and institutional power resources. Second, these results offer a wider theoretical contribution, insofar as they reassert the necessity of conceptualizing social change in terms of distinct regulatory regimes – financialization being the most recent. Flaherty's (2015) evidence shows that bargaining asymmetry is driven by a variety of factors beyond fiscal policy alone, such as regulatory control, class-based power resources, financial globalization and institutional weakening. Whilst the weight of financial sector profit and productivity has continued its upward climb relative to other economic sectors, in many it continues to outstrip the real economy in terms of its contribution to productivity and growth.

Based on the research cited above, which was carried out on OECD countries, we have designed our own empirical analysis. The results that we have obtained are presented in the next section of the paper.

Financialization and Income Inequality: an Econometric Study with Panel Data

In order to study the dependencies between the indicator of income inequality and the indicators of a country financialization, we have decided to carry out analysis of panel data. Such an approach is an advantageous solution in a situation where long time series of data are unavailable for a given entity and, in addition, there might be gaps in the existing time series. Taking into consideration the frequency of gaps in the available data on the European Union States, we have decided to analyse the period between 2004 and 2013. The empirical study makes use of annual data on three countries from Central and Eastern Europe (Poland, the Czech Republic, and Hungary) and four selected Western European countries. The second group was included in order to increase the number of observations, to obtain broader conclusions, and to allow comparison of countries from both groups as far as differences in the indicator of income inequality was concerned.

The GINI coefficient of equivalised disposable income was adopted as the indicator of income inequality. Its values are published by Eurostat[1]. We decided to use this indicator since there were much fewer gaps in the data it offered than in the alternative indicator estimated by the World Bank. It needs to be highlighted though that these sources do not offer precisely the same values of indicators, which results from differences in the methodology of estimation. Despite the differences, we have nevertheless established quantitative relations

1 Data available at: http://appsso.eurostat.ec.europa.eu/nui/show.do; code: ilc_di12.

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between the data provided by Eurostat and the data of the World Bank, which made it possible to fill two gaps in the series of Eurostat with the data offered by the World Bank. Owing to the lack of data at both sources, it was impossible to reliably fill the gap for the Czech Republic in 2004, therefore this observation was overlooked in the analysis.

Fluctuations in the indicator of income inequality are illustrated in Figure 2. One may note that within the period under examination, the most prominent decrease in the GINI coefficient is observable in Poland whereas increases are noticeable only in France and Germany. In view of recent events related to the mass immigration to European countries, it is easy to assume that it might have to do with a low (negative) migration rate in Poland and a positive and a growing migration rate in Germany. However, the example of France seems to contradict such a hypothesis; the migration rate dropped in this country.

On the basis of the available data, panel models have been developed, assuming the fixed individual effect of entities[2]. Each model takes the following general form:

$$GINI_{it} = \sum_j \beta_j \cdot X_{jit} + \alpha \cdot XFIN_{it} + \beta_0 + u_i + \varepsilon_{it}; \quad (1)$$
$$i = 1,2,..7; \quad t = 1,2,...10$$

where:

$GINI_{it}$ = value of the GINI coefficient in period *t* in country *i*,

X_{jit} = value of the *j* independent (macroeconomic) variable in period *t* in country *i*,

$XFIN_{it}$ = an indicator of financialization of country *i* in period *t*,

u_i = an individual (singular) effect in country *i*,

ε_{it} = IID random variable.

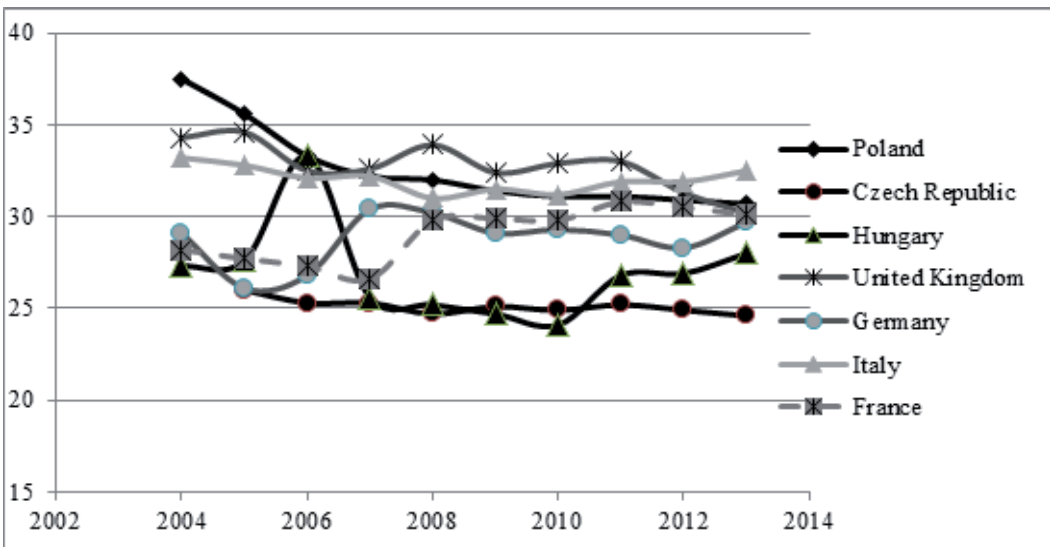
The following variables were used as the indicators of financialization:

1) the contribution of the financial sector (FIRE)to total value added (FIRE_VALUE_AD, in percent),
2) the proportion of the employed in the FIRE sector in the total employment (FIRE_EMPLOY, in percent),
3) private debt to GDP ratio (PRIV_DEBT, in percent),
4) stock market capitalization to GDP ratio (MARK_CAP, in percent),
5) a synthetic indicator of financialization, which is the average of all the above-mentioned indicators that have underwent prior normalization by way of unitarization (FINANC_INDEX).

In each case, when the significance of the individual effects has been verified, very high F statistics have been obtained. Hence it has turned out that it is not unfounded to conclude that certain country-specific factors (other than the regressors under analysis) cause the variation in the indicator of income inequality. Therefore, while analysing the values of the parameters reflecting individual effects (Table 2), one may notice that a generally higher level

2 We have verified that there are no individual time effects, and thus none of the periods under examination stood out with a particularly higher or lower level of the GINI coefficient than had been expected.

Figure 2: The GINI coefficient: 2004-2012



Source: Data from Eurostat and two own extrapolated observations based on the World Bank data

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of the indicator of income inequality may be expected in Western Europe and a lower level may be expected in Central and Eastern Europe. In particular, if the same values of independent variables are assumed, one may expect the highest level of the GINI coefficient to be encountered in Great Britain – regardless of the adopted financialization indicator, the values of the parameter reflecting the individual effect were always the highest in this case. Whereas under the same assumptions, the lowest level of the GINI coefficient may be expected in the Czech Republic.

Due to the strong mutual correlation between the independent variables, the estimates of the majority of the parameters are encumbered with a great error, which results in their statistical insignificance.[3] Nonetheless, similarly to Kus (2012), it is worth keeping these variables in the model for the sake of controlling their influence on the dependent variable. In the course of analysis of the results obtained in this case, it is worth noticing the fact that the only significant parameters in the models are the individual effects and, importantly, the parameters expressing the influence of financialization indicators. The estimates of the parameters are negative, which means that the increase in financialization indicators in a given country is (*ceteris paribus*) accompanied by a decrease in the GINI coefficient (i.e., a drop in income inequality). An exception is the case where the value of the private sector debt is adopted as a financialization indicator: the slope value is positive but simultaneously it may not be regarded as significantly different from zero.

3 Variance inflation factor takes very high values – significantly exceeds 10.

Table 2: Panel data models with fixed effects of countries for various financialization indicators

Variables and parameters		Model 1	Model 2	Model 3	Model 4	Model 5
Intercepts	Beta_zero	37.40***	55.73***	31.25***	34.05***	40.66***
	Ind.Effect_Czech Republic	-6,642	-6,893	-4,972	-6,655	-9,11
	Ind.Effect_Poland	-2,526	-3,312	-0,169	-1,501	-6,44
	Ind.Effect_Hungary	-4,969	-4,294	-3,541	-5,459	-6,57
	Ind.Effect_Great Britain	7,569	11,418	5,892	6,836	12,82
	Ind.Effect_Germany	0,61	0,688	-1,333	0,987	0,56
	Ind.Effect_Italy	4,023	0,184	3,349	3,157	3,22
	Ind.Effect_France	1,271	1,52	0,275	1,895	4,51
Regressors	GDP growth (%)	0,031	-0,058	0,054	0,046	-0,01
	Unemployment (%)	0,147	0,391	0,33	-0,075	0,55
	Female unemployment (%)	0,102	-0,143	-0,135	0,399	-0,26
	Wage growth (%)	0,162	0,072	0,145	0,126	0,01
	Social expenditure (% of GDP)	0,179	-0,136	0,025	-0,302	-0,21
	Current account balance	0,004	0,028	0,089	-0,06	-0,02
	Remittances (% of GDP)	0,201	0,53	0,641	1,274	0,83
	Rate of migration	-0,017	-0,04	-0,04	-0,04	-0,13
	FIRE value added (%)	-0.606**				
	Employment in FIRE (%)		-6.37***			
	Private sector debt (% of GDP)			-0,03		
	Market capital. (% of GDP)				-0.031*	
	Financialization index					-19.9***
	DW	1,44	1,86	1,31	1,47	1,69
	F for individual effects	21.2***	34.11***	13.37***	21.3***	28.97***
	Number of observations	69	69	69	62[4]	62[3]

*p< 0.1; **p< 0.05; ***p< 0.01

4 Due to the lack of data concerning the stock market capitalization to GDP ratio in 2013, analysis was carried out on the basis of data from the period: 2004-2012.

Source: Own calculations

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Although control of the influence of macroeconomic factors is advantageous, it is tempting to remove the most insignificant variables (in view of *p*-value). Hence the procedure of stepwise elimination of variables was conducted for each model (1-5). The results are presented below (*p*-values are provided under parameter estimates):

Model 1 after reduction

$$GINI_{it} \hat{=} 0{,}26 \cdot UNEMPL_{it} - 0{,}68 \cdot FIRE_VALUE_AD_{it} + 44{,}08 + \hat{u}_i$$
$$(0{,}008) \qquad (0{,}003) \quad LSDV - R^2 = 0{,}798;$$
$$Within - R^2 = 0{,}175; \quad DW = 1{,}26;$$

Model 2 after reduction

$$GINI_{it} \hat{=} 0{,}199 \cdot UNEMPL_{it} - 0{,}645 \cdot FIRE_EMPLOY_{it} + 53{,}55 + \hat{u}_i$$
$$(0{,}013) \qquad (0{,}000) \quad LSDV - R^2 = 0{,}845;$$
$$Within - R^2 = 0{,}37 \quad ; \quad DW = 1{,}76;$$

Model 3 after reduction

$$GINI_{it} \hat{=} 0{,}18 \cdot UNEMPL_{it} - 0{,}04 \cdot PRIV_DEBT_{it} + 34{,}89 + \hat{u}_i$$
$$(0{,}006) \qquad (0{,}05) \quad LSDV - R^2 = 0{,}79;$$
$$Within - R^2 = 0{,}15; \quad DW = 1{,}21;$$

Model 4 after reduction

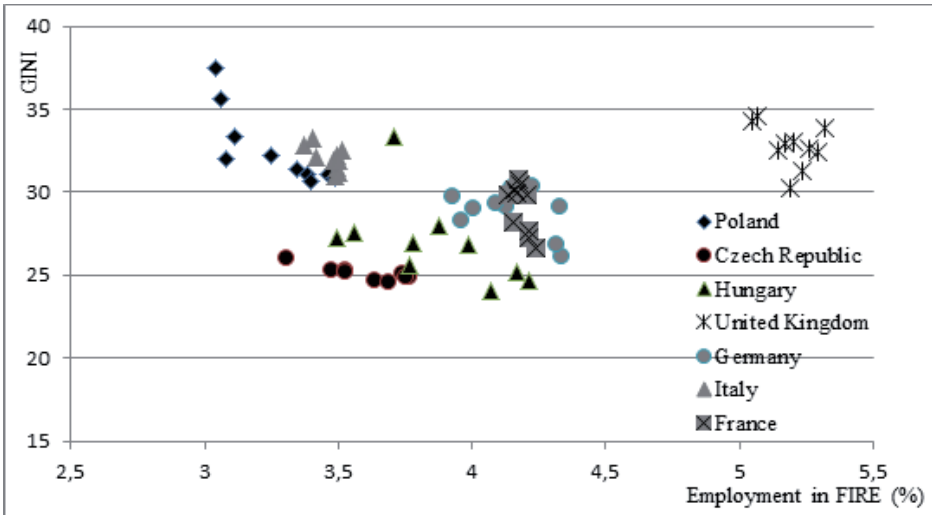
$$GINI_{it} \hat{=} 0{,}36 \cdot UNEMPL_{it} - 0{,}56 \cdot SOCIAL_SPEND_{it}$$
$$(0{,}003) \qquad (0{,}016)$$
$$+ 1{,}69 \cdot REMITT_{it} - 0{,}03 \cdot MARK_CAP_{it}, 36 + \hat{u}_i$$
$$(0{,}012) \qquad (0{,}0677)$$
$$LSDV - R^2 = 0{,}815; \quad Within - R^2 = 0{,}217; \quad DW = 1{,}23;$$

Model 5 after reduction

$$GINI_{it} \hat{=} 0{,}22 \cdot UNEMPL_{it} - 21{,}33 \cdot FINANC_INDEX_{it} + 37{,}01 + \hat{u}_i$$
$$(0{,}011)) \qquad (0{,}000) \quad LSDV - R^2 = 0{,}847;$$
$$Within - R^2 = 0{,}354; \quad DW = 1{,}62.$$

The results indicate a very significant correlation between the level of unemployment and income inequality. The positive sign of the parameter is in line with the expectations: an increase in unemployment is accompanied by a rise in the disproportions in the levels of income which individual citizens have at their disposal. Importantly, the obtained results confirm the existence of significant dependencies between the level of the GINI coefficient and such financialization indicators as the share of the employment in the financial sector, and the contribution of this sector to value added creation. As seen earlier, the indicator of market capitalization in a given country turns out to be a slightly less significant factor. However, irrespective of which indicator of financialization has been employed, a negative slope value has been obtained. A negative correlation between the selected financialization indicators and the GINI coefficient may be noticed in Figure 3. This correlation is even more pronounced when the synthetic country financialization indicator is used (Figure 4). At the same time, distribution of the points displaying the values of variables in individual countries justifies the adoption of methods appropriate for panel data; in contrast to analysis based on data pooling (it is easy to verify that if the possible existence of individual effects is disregarded, the slope value would be positive but statistically insignificant). The figures clearly demonstrate that in Western European countries (especially in Great Britain) financialization indicators are higher.

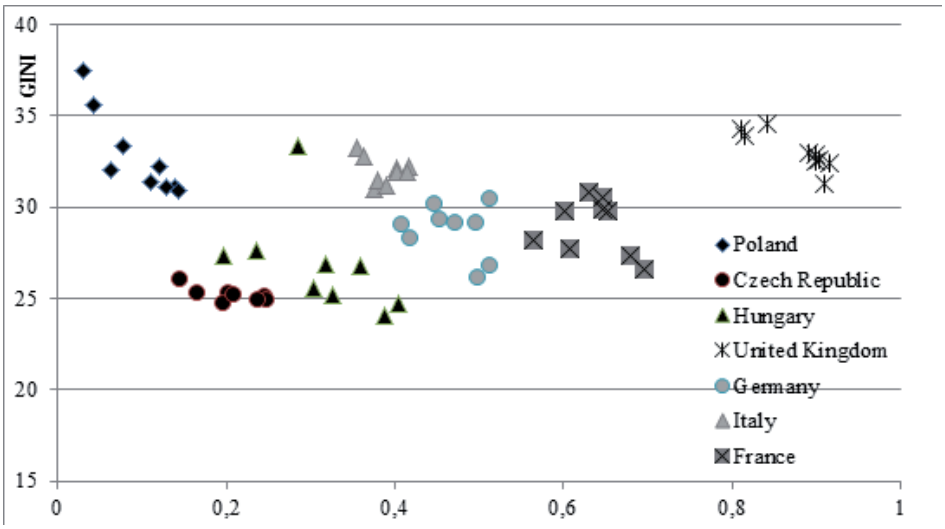
Figure 3: The GINI coefficient over the period: 2004-2013, depending on the employment in finance sector as a share of total employment



Source: Own study

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Figure 4: The GINI coefficient and the synthetic country financialization indicator over the period: 2004-2012



Source: Own study

It is worth noting that reduction of model 3 caused a change in the sign of the parameter expressing the influence of the size of the private sector debt and the parameter became statistically significant. Such a change may be easily explained by the fact that this variable is correlated with others, especially with the GDP growth rate and wages (where the coefficient of correlation is usually clearly negative), and the level of social expenditures (a positive correlation). Due to the fact that omission of important variables may lead to the encumbrance of the slope values, the result obtained in this case should be treated with caution.

The models presented so far are the outcome of application of the simplest estimator from among the ones used for panel data: i.e., the FE (fixed effects) estimator. Therefore, several facts are worth mentioning. First of all, in each case the results of the Hausman test indicate that there is no need to apply the RE (random effect) estimator since the hypothesis that this estimator is better (i.e. more effective) may be rejected. One must note, however, that although we managed to account for a large portion of the general variation in the level of the GINI coefficient (LSDV-R^2 was over 80%) with the use of these models, if we take a look at its values for a particular country, we may see that a large range of variation in the GINI coefficient remains unexplained (within-R^2 is much lower). The biggest data deviations from the models were observed for Hungary, France, and Germany. What is more, in the majority of cases, a clear autocorrelation of the random variable was noted – except for models 2 and 4 (where financialization indicator was the proportion of the employment in finance sector as a share of total employment and the synthetic financialization indicator, respectively). In order to eliminate this autocorrelation, we have decided to use a dynamic model of panel data in the study, as the case with research by Beck & Katz (1995) and Kus (2012); and hence a model that has the following general form was adopted:

$$GINI_{it} = \delta \cdot GINI_{i,t-1} + \sum_j \beta_j \cdot X_{jit} + \\ + \alpha \cdot XFIN_{it} + \beta_0 + u_i + \varepsilon_{it} \quad (2)$$

Owing to the fact that some independent variables do not need to be exogenous (which is assumed when the FE estimator is used or the simplest method of estimation of a dynamic panel: the first differences estimator), we have decided to employ the Generalised Method of Moments (GMM), precisely: the procedure proposed by Arellano & Bond (1991). The method consists in, among other aspects, replacing the original values of the independent variables with the values of instrumental variables non-correlated with the random variable in the model[4]. Conventionally, estimation of parameters takes place along with verification of autocorrelation of the random variable (description of the test may be found in Arellano & Bond (1991)) and examination of the exogeneity of the instruments with the Sargan test (1958). Adoption of this method of estimation, however, leads to elimination of the absolute term and the individual effects in the first stage

4 A description of the method in the Polish language may be found in Gruszczyński et al. (2012).

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of the procedure (hence the relevant parameters are not provided in the table containing the results of estimation). This happens by way of transformation of formula (2) and the formula relevant for the GINI coefficient$_{it-1}$ into the formula for increments:

$$\Delta GINI_{it} = \delta \cdot \Delta GINI_{i\,t} + \sum_j \beta_j \cdot \Delta X_{jit} + \alpha \cdot \Delta XFIN_{it} + \Delta\varepsilon_{it} \quad (3)$$

Estimates of the slope values obtained with the Arellano-Bonda method and the results of diagnostic tests are juxtaposed in Table 3.

Analysis of the obtained results allows us to claim that there are no grounds to reject the hypothesis about the exogeneity of the instruments adopted in the process of estimation (the Sargan test) and there are no grounds to state that the random variable is significantly autocorrelated. In view of the above, the fact that the parameters expressing the influence of the three financialization indicators are statistically significant is of great importance. All the parameter estimates have turned out to be negative, which confirms the negative correlation between their level and the degree of income inequality discovered with the use of the models presented earlier. The conclusion on the negative correlation between the value of the GINI coefficient and the synthetic financialization indicator may be drawn with the greatest confidence level.

Conclusions

The most general conclusion that might be arrived at after empirical analysis is that, in the majority of cases, the variables used in the model do not determine the level of country income inequality measured by the GINI coefficient. We appreciate that there are individual effects, which means that the level of inequality is influenced predominantly by other factors – not taken into account in the model, which are related to the nature of a country.

From the perspective of detailed analysis of the obtained results, we notice, however, quite an unexpected role played by financialization indicators in the explanation of the GINI coefficient variations. It turns out that an increase in the level of financialization is accompanied by a decrease in the GINI coefficient, i.e. a reduction of the income inequality. This result is different than the results obtained by Kus (2012) and Dunhaupt (2014, p. 21-26). One must note though that those studies were carried out on data for the periods: 1995-2007 and 1980-2010, respectively. Perhaps the obtained results are influenced by the stage of the financial cycle. Unfortunately, in order for this claim to be verified, longer time series would need to be available for the countries under examination whereas the reality is that databases containing data on

Table 3: Dynamic panel data models obtained for various financialization indicators of a country

	Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Slopes	GINI (t-1)	-0,0118	-0,02	0,064	-0,029	0.206***
	GDP growth (%)	0,0219	-0,018	0,052	0,036	-0,025
	Unemployment (%)	-0,3763	-0,444	-0,529	-0,014	0,6
	Female unemployment (%)	0,489	0,576	0,544	0,272	-0,274
	Wage growth (%)	-0,1012	-0,07	-0,125	-0,125	-0,077
	Social expenditure (% of GDP)	-0,1722	-0,201	-0,112	-0.503**	-0,453
	Current account balance	0,1231	0,116	0,178	-0,009	0,008
	Remittances (% of GDP)	0,1318	0,257	0,158	0,964	1,13
	Rate of migration	-0,0005	-0,01	-0,005	-0,019	-0,092
	FIRE value added (%)	-0,4152				
	Employment in FIRE (%)		-4.21***			
	Private sector debt (% of GDP)			-0,0234		
	Market capital. (% of GDP)				-0.021**	
	Financialization index					-18.13***
p values	Sargan test	0,554	0,635	0,548	0,582	0,738
	AR1 of error	0,235	0,205	0,212	0,308	0,343
	AR2 of error	0,511	0,346	0,425	0,968	0,625

Source: Own calculations

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the selected countries have numerous gaps. Furthermore, it may not be ruled out that the adopted method of determination of the income inequality indicator may to some extent influence the results.

While searching for the reasons these dissimilar results, it is worth considering two facts. First of all, the analysis of the synthetic country financialization indicator which we have developed points to a conclusion that the level of financialization is higher in the selected European countries belonging to the G-7 (especially Great Britain) than in the Central and Eastern European countries. Simultaneously (and second of all), negative individual effects were obtained for these Central and Eastern European countries, which means that the level of inequality in these countries is relatively smaller. This encourages a hypothesis that the correlation may have a slightly different character in a short period (i.e. in a specific stage of a financial cycle) than in a longer period. Unfortunately, verification of this hypothesis is hindered by the lack of comparable, sufficiently long time series in this case as well.

The most prominent correlation is noticeable between the unemployment rate and the level of income inequality. The obtained results are indicative of a very strong correlation between these two variables. An increase in unemployment is accompanied by a rise in the disproportions in the level of income that individual citizens have at their disposal whereas a decrease in the level of unemployment exerts influence on the improvement in the GINI coefficient and thus on a reduction in inequality. Simultaneously, the obtained results confirm the existence of significant correlations between the level of the GINI coefficient and such financialization indicators as employment in the finance sector as a share of total employment, and the contribution of the financial sector to the total value added creation.

Although the average estimation errors of the remaining parameters are mostly great (which translates into their statistical insignificance), it is worth taking a look at two facts:

1) The estimates of the parameter expressing the influence of the social expenditures in relation to GDP are usually negative, however, it may only be concluded once that they are significantly negative.
2) The estimates of the parameter expressing the influence of the migration rate are always negative but unfortunately it was not possible to achieve high precision of estimation for this set of variables; there have been no grounds to conclude that there is a significant correlation between the migration rate and income inequality.

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