



**“A sector balances-based inquiry into the effects of
financialization on income inequality: Evidence from selected
EU countries during the period 1999-2016”**

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Abstract

This paper investigates the relation between financialization and income inequality using novel financialization indicators inspired by the theory of the monetary circuit and constructed via sector balances data from Eurostat Quarterly National Accounts. The theoretical channels predict that as the financial sector's activity increases, the creation of capital gains, dividends, and interest income increases wealth for a few asset holders. As a result, sector behaviors become more short-term, as evidenced by contemporary corporate strategy that emphasizes profit maximization for shareholders via financial investments. Long-term real investment suffers, employment becomes more flexible and real wages lag behind, increasing income inequality. The estimation results provide mixed evidence for a direct link between financialization and income disparities. This is attributed to the length of the dataset, the possibility of reverse causality, and the possibility that the studied relation holds in the long run.

Keywords: Financialization, income inequality, circuit theory, excess finance, borrowing

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Introduction

The financial crisis of 2007/2008 has sparked a renewed wave of interest in what the proper role of finance should be in the economy and in society. The role of finance, though, is not the only topic under scrutiny. Rising income inequality has been and still is another phenomenon debated in both academic and policy circles. International organizations, such as the IMF and the BIS, have consistently warned on the dangers of growing inequality. A Staff Discussion Note of the IMF in 2015 noted that “income distribution matters for growth” and outlines some of the believed causes of increased income disparities, with technological progress and changing labor market institutions being two of them. Claudio Borio of the BIS has stressed the importance of including the financial cycle in models so that their prediction power is improved, and policymakers can address financial risks (Borio 2012).

While the causes and implications of both income inequality and financial deepening have been explored individually, empirical and theoretical research on the potential link between financialization (defined as the increasing role of financial markets in the economy and society) and income inequality is still scarce. When it comes to measuring the effect of financial development on income inequality, mixed evidence is found. Most authors usually measure higher financial development in terms of Credit to GDP and their models that are set up show that a higher measure of Credit-to-GDP is mostly associated with lower inequality (Clark et al, 2006; Kappel, 2010). One explanation given is that highly developed capital markets allow poorer households to borrow and develop their skills, and thus increase human capital (Galor and Moan, 2004; Galor and Zeira, 1993). Other studies show that poorer households usually rely on family and friends for capital and only the richer ones have access to the financial sector (Beck et al, 2007). Thus, as financial restrictions are relaxed, the more well-off are the ones who benefit.

Other authors argue that financialization has only worsened income inequality. This is mostly due to the fact that firms started investing more in existing financial assets than in the real economy since returns are higher and easier to achieve (Crotty, 2005; Stockhammer, 2010). This has led to a slowdown in productivity, a rise in unemployment and lower wage growth for most households. Moreover, households have

also tried to keep up their living standards with the more well-off households by borrowing (Stockhammer, 2010). Most empirical studies on whether financialization has worsened income inequality measure the increased role of the financial sector using the income generated by the financial industry in terms of GDP, its value added relative to other sectors or its employment level in terms of total employment (Assa, 2012; Kus, 2012). In this paper, three “new” proxies of financialization are utilized which have been inspired by Spano (mimeo) and by Graziani’s Monetary Circuit Theory. Sector balances data are utilized to determine the value of “excess financial flows”, the degree to which borrowing (lending) has exceeded a sector’s deficit (surplus), or to what degree borrowing has exceeded real investment, and thus debt is used for financial investment. These measures will be utilized to deal with the question of whether there is a relation between financialization and income inequality. Endogeneity and robustness tests are conducted and reverse causality is taken into account using lagged independent variables and causality tests.

The paper is structured as follows; Section I introduces a literature review of the treatment of finance, financialization and income inequality in the literature while Section II introduces the theory of the monetary circuit, how it helped inspire the “new” measures of financialization utilized in this paper and how the financialization indicators were constructed. Section III and IV outline the methodology, a description of the data along with trends and outliers. Section V presents the results and Section VI outlines some robustness checks. Finally, Section VII discusses the results in greater detail, while noting possible downsides of the current method. Recommendations for further research are debated as well. The conclusion summarizes the main points of the paper and discusses policy implications.

I. Literature Review

Finance and Financialization

The increasing role of financial markets in the last decades is referred to as financialization. Financialization does not have a unanimously-agreed definition. Palley (2008, pg. 1) defines financialization as “a process whereby financial markets, financial institutions and financial elites gain greater influence over economic policy and economic outcomes”. Epstein (2015) chooses to define financialization as “the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies”.

When it comes to the debate on the increasing role of financial markets in the economy, it is usually argued that this enhances efficiency. Palley (2008) asserts that this goes back to Arrow and Debreu (1954) who argue that as financial markets get bigger and the availability of financial instruments rises, the allocation of resources improves, as future outcomes are priced better. Arguments that claim speculation is destabilizing run counter to the view of Friedman (1953) who claimed that speculators help in returning prices to their “correct” values when prices diverge from fundamentals. Not every neoclassical economist agrees with the above views. De Long et al. (1990) suggest that rational speculators could destabilize equity markets if they follow positive feedback investment strategies, meaning that they “buy high and sell low”. Blanchard (1979) notes that speculative bubbles can arise even if economic agents have rational expectations. Additionally, bursting bubbles could possibly affect the real economy. While these papers and views do not deal with income inequality per se, they are relevant in a sense that speculation and bubbles reward those who hold financial assets. In most cases, the highest income classes are those with access to financial markets and the ability to purchase/sell financial assets. Thus, during a speculative bubble, inequality might worsen considering that capital gains from rising assets prices are accrued by the more well-off.

Certain authors have recognized that the process of financialization might have come with a number of consequences. For example, Stockhammer (2010) and Palley (2008) examine in detail how the increasing dominance of finance over real economic activity has reshaped the behavior of non-financial corporations, households and financial

markets themselves. The process of financialization essentially entails that instead of newly created credit being extended to the real sector for investments in real assets, credit flows back to the financial system to purchase existing financial assets.

The behavior of non-financial corporations has changed drastically since the 1980s, the period which financialization seems to have started. Maximizing shareholder value has become the main goal of businesses, which many authors believe has come at the cost of real investment and a ballooning level of business debt for the sake of share buybacks (Stockhammer, 2010; Palley, 2008). “The social costs of such strategies (...) often involved downsizing employment and pressure on wages” (Stockhammer, 2010, pg. 4). Lazonick and Osullivan (2000) do a remarkable job of tracing the history of the shareholder value strategy of corporate governance. They argue that corporate governance has shifted from a “retain and invest” strategy, where employees are retained and revenues kept and reinvested in capital equipment, to “downsize and distribute”, where corporations cut costs through layoffs, wage and benefit cuts, and decreasing real investment to maximize the stock market value of the company. As Crotty (2005) explains, this shift might have been encouraged by academic economists through the promotion of the agency problem, which states that the real owners of a company are the ones who own the stock of the company, and that the role of management is maximize profits for the shareholders. Friedman himself argued that “the social responsibility of business is to maximize profits” (Friedman, 1970, pg. 6).

Moreover, financialization seems to have had a significant impact on the household sector, as well. This is evident from the fact that “there has been a noted shift towards relying on access to credit” (Stockhammer, 2010). The reduction of real investment, along with institutional changes such as the decline of unions, has led to a slowdown in employment and wage growth. A logical conclusion here would be that consumption should have slowed down if real wages stopped growing. However, the era of financialization has been marked by a rapid increase in household debt which has helped maintain consumption growth. While household debt can support demand for a while, its long-term sustainability is doubted. For example, Beck et al. (2012) find that household credit is not associated with economic growth.

The financial system itself has changed in the era of financialization. Stockhammer (2010) argues that a growing part of financial activities take place in the unregulated

shadow banking system. These activities are mostly fee-generating and differ from the regular banking practice of maximizing the interest differential between loans and deposits. An example of a fee-generating activity is the “originate and distribute” model where illiquid loans, such as mortgages, are re-packaged and sold off to investors in the form of asset-backed securities. There has also been a noted shift in the form of loans that banks create. Schumpeter (1939) distinguished between “productive debt”, which is used to finance non-financial firms that spur innovations, and “unproductive debt” which is directed to consumers and financial businesses. Following Schumpeter’s argumentation, Bezemer et al. (2017) confirm that there has been a “debt shift” toward the Finance, Insurance, Real Estate (FIRE) sector in many countries.

The institutional and behavioral changes that households, businesses and financial markets have undergone are of vital importance. Knowledge of these changes is necessary for the forthcoming discussion on the link between financialization and inequality.

The Views on Income Inequality

Inequality is defined by the Oxford Advanced Learner Dictionary as “the unfair difference between groups of people in society when some have more wealth, status or opportunities than others”. In this paper, the main focus will be on how national income is distributed across income classes in society. There are many indexes that measure the degree of income inequality, the GINI index being the one most frequently used.

Several economists pay close attention to the distribution of income due to the fact that, in the presence of different propensities to consume out of profits and wages, a shift in the structural distribution of national income can have either beneficial or detrimental effects for an economy. There is a strong agreement on what is behind the rise in income inequality. Palley (2015) argues that the abandonment of full employment policies and the severance of real wage growth and productivity growth shifted the distribution of income towards profits. The discussion on the causes of inequality must also include the effect of financialization. Stockhammer (2010) outlines three channels through which financialization has contributed to rising inequality. The first channel would be “the rise of rentiers income, meaning dividends, interest payments, and capital gains”,

the second channel would be “the rise of incomes in the financial sector” and the third channel would be the shifting in the power relations between capital and labor.

The aforementioned channels warrant some further discussion, as they constitute this paper’s theoretical building block of the financialization-inequality nexus. Due to rising activity in financial markets, returns on financial instruments have exploded. As mentioned before, the returns from the trading and holding of financial instruments accrue to a small portion of the population, who have the ability to purchase such assets. Thus, as the financial sector expands, along with the availability and trading of new instruments, only a small proportion of people benefit from this process and as a result, wealth inequality rises. The financialization period has also witnessed a rise in managerial pay. Both financial and non-financial institutions have seen their profits explode in comparison to worker’s pay. Palley (2008) argues that this is due to the linking of CEO pay to stock performance. This was supposed to realign managerial interests to the company interests but instead, managers have focused on short-term profits by maximizing share prices. Thus, as a result of higher financial trading and rising stock market prices, CEOs have directly benefited while income and wealth disparities have widened. Moreover, the corporate strategy of “downsize and distribute” has depressed real investment and productivity growth. Finally, the advent of financialization has coincided with a shift towards more market-friendly policies, a slowdown in economic growth and the declining participation of workers in unions. As a result, union bargaining power has declined, leading to lower real wage growth and higher corporate profits and thus a rise in income inequality. The intermediary steps from financialization to income inequality are shown in Figure 1.

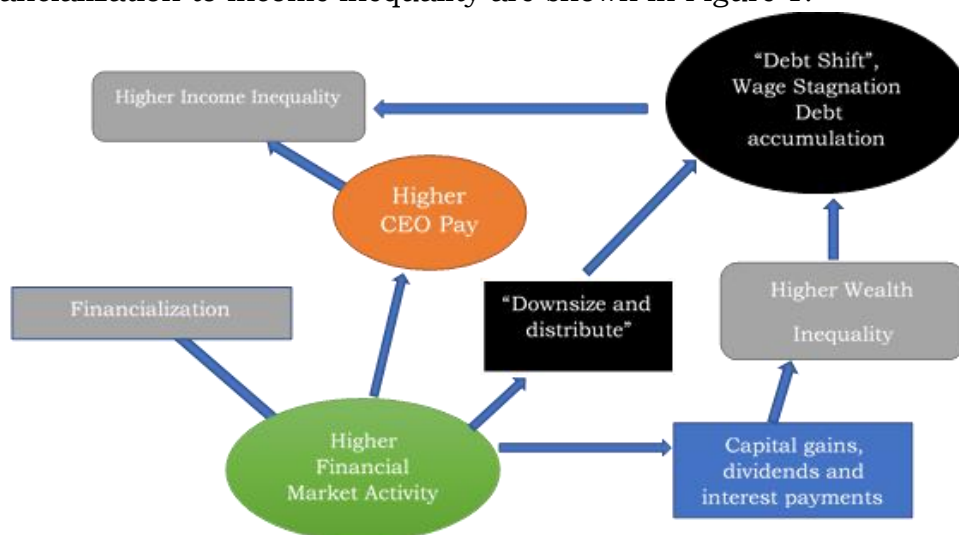


Figure 1 – The Causal Chain of the Financialization Income Inequality Nexus

The Empirical Link between Financialization and Inequality

The marginal productivity theory predicts that changes in the financial structure of an economy cannot impact income distribution as every factor is always paid its marginal product. Even if there is a shift towards a higher level of national income going to profits or higher earners, this must be an optimal market outcome. Empirical results, though, present a mixed picture. Jaumotte et al (2013) use a panel of 51 countries for a period of 23 years to separately estimate the effects of technology, trade and financial globalization on income inequality. They find that both technological progress and financial globalization tend to increase inequality. Denk and Courneade (2015) find that higher levels of credit and stock market valuations lead to a more unequal income distribution. Kappel (2010) investigates the effects of financial development on both income inequality and poverty. The author utilizes Credit-to-GDP and stock market capitalization as measures of financial development as well as an indicator of access to financial services and finds that all measures have a significant negative effect on income inequality. Beck et al. (2007) also examine the impact of financial development on income inequality and especially on the income share of the poorest quintile. They find that higher financial development reduces income inequality and helps the poorest quintile disproportionately more. Clark et al. (2006) also confirm that higher financial development reduces inequality. The reasons most often cited on why higher financial development reduces income inequality is that better access to financial intermediaries allows poorer households to borrow for investment while higher stock market capitalization enhances the efficient distribution of capital, boosting growth and thus incomes. Nobel Prize winner Joseph Stiglitz regards income inequality as a potential economic threat. In his Rethinking Macroeconomics paper, Stiglitz points out that income distribution matters due to the differences in the propensity to consume. If income is more concentrated in the hands of individuals that tend to save more, aggregate demand is impacted negatively. In terms of the current crisis, Stiglitz believes that lax financial conditions masked the negative effect of growing income inequality by allowing households at the bottom of the income ladder to borrow more in order to consume.

The empirical evidence on the link between financialization and income inequality in heterodox circles is scarcer, compared to the theoretical argumentation. Stockhammer

(2009) notes that IMF and European Commission studies at the time of writing did not take into account financialization as a potential culprit for the declining wage shares of national income in many developed countries. The studies also suffered from several econometric flaws, an example being the potential autocorrelation of residuals which was not taken into account. Stockhammer tries to replicate the above analyses and extends them by adding more variables that might affect the wage share of national income, such a proxy for financial globalization which is measured as the log value of external assets and liabilities in terms of GDP. Stockhammer, however, argues that due to the existence of unit roots in many variables, regression results might be spurious. The paper utilizes a fixed effects panel model with and without time effects, a first difference estimator and also presents 5-year average results with and without period fixed effects. The results of the medium-term analysis of the extended models that trade openness, financial globalization, and lower trade union density have contributed to the declines in the wage shares of OECD countries.

Kus (2012) investigates whether financialization has had any effect on income inequality and whether such an effect is being mediated by political and institutional factors for 20 OECD countries. The dependent variable used as a proxy for inequality is net GINI since it measures the distribution of disposable income. The financialization indicators that are utilized are the total value of stock traded as a percentage of GDP, bank profitability measured in terms of bank income before tax as a percentage of GDP and the value of securities in terms of bank assets. These variables are aggregated into one index by averaging the standardized scores of the indicators. Panel analysis is utilized with various control variables that might affect inequality, such as trade openness, union density, and social spending, with dummies to control for country fixed effects added. To deal with the econometric problems of autocorrelation and heteroskedasticity that come with panel analysis, the author calculates panel-corrected standard errors and includes a lagged dependent variable. The problem of endogeneity was also addressed by replicating the analysis using the dynamic General Method of Moments technique. The author also split the countries into two groups, one group represented the countries with relatively weak unions while the other group represented the countries with strong unions. In both cases, it was found that financialization exerts upward pressure on income inequality. This is in agreement with the fact that unions are less powerful in developed countries than in previous years.

Assa (2012) uses the financial sector's share of value added in GDP and its share of employment in comparison to total employment as indicators of financialization and finds a strong negative relation between GDP growth and financialization and a positive relation between inequality and financialization. The author uses fixed effects panel analysis, but his econometric method suffers from many problems. The only control variable used is GDP per capita and the usual problems of autocorrelation and heteroskedasticity are not dealt with in the paper. Thus, his results should be treated with caution.

Bezemer & Samarina (2016) investigate the effect of financial development on different measures of income inequality by constructing separate variables for bank credit towards non-financial businesses and household consumptions and for bank credit towards the FIRE sector. This is due to the fact that different forms of credit will have different effects on income distribution. On the one hand, loans towards the FIRE sector support financial sector wages, capital gains, interest and dividend incomes which accrue to higher earning households, thus putting upward pressure on income inequality. On the other hand, credit towards non-financial businesses supports goods and services production and wages of low and middle-income households, thus decreasing income disparities. Panel data for several European countries were constructed and several control variables were utilized. Business cycle effects are controlled for by using a measure of the output gap and by running 3-year averages. The econometric problems that come with panel analysis were treated in several ways. Heteroskedasticity and autocorrelation were dealt with using country-specific cluster errors and by the 3-year averages specification. Endogeneity and reverse causality were addressed using lagged credit variables and GMM specifications.

This paper utilizes a new approach to the issue of financialization and to its possible connection to rising income inequality. While most papers discussed previously use credit measures, stock market capitalization or the Value Added of the FIRE sector as indicators of financialization, this study utilizes sector balances data to construct indicators for financial flows that are unrelated to real sector transactions but are rather used for purchases of existing financial assets. As explained before in this paper, investment in the production of real goods and services or consumption of such goods and services support the real economy and thus mainly the incomes of middle and low-

income classes. Investments in financial market instruments instead produce capital gains, dividends and interest income that benefit the more well-off.

The key to understanding financialization lies with the modern operations of the banking system and how it finances the production process. The best way to describe this process, and how the new financialization indicators used in this paper are constructed, is through the theory of the monetary circuit and this is done in section II.

II. Circuit Theory and Financialization

The Monetary Circuit

This paper utilizes a new method of measuring the extent of financialization. This method was introduced first by Spano (mimeo). This new method is based on the circuit theory of Augusto Graziani. Circuit theory describes the process of how money is created in an economy in the opening period of production, how it circulates between sectors and how it is finally destroyed. The monetary circuit described by Graziani in his work (*The Monetary Theory of Production, 2003*) is depicted in Figure 2.

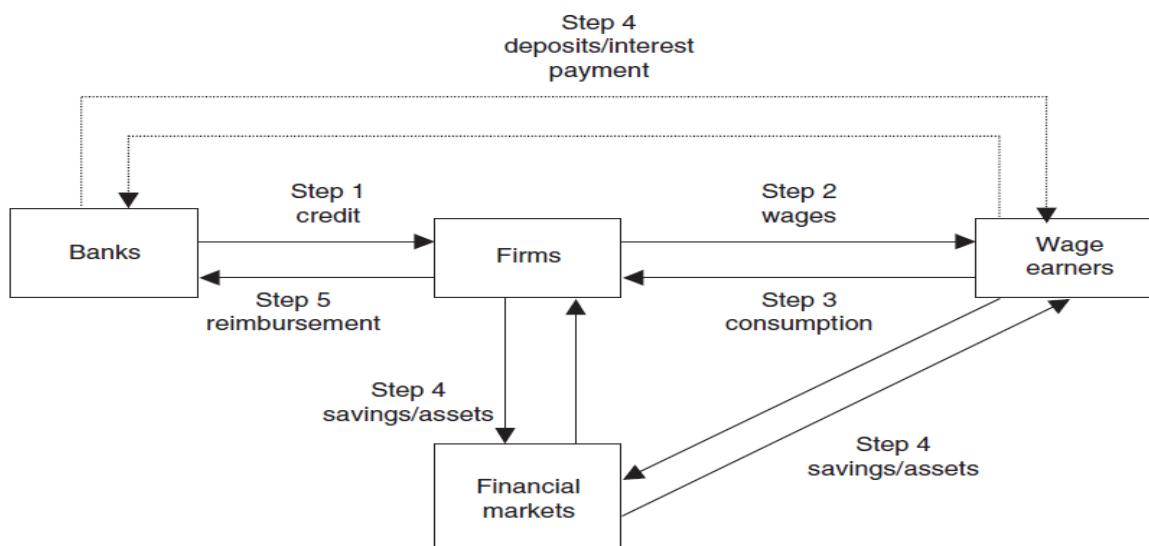


Figure 2 – Graziani’s Monetary Circuit
reprinted from Fumagalli & Fucarelli (2011)

The monetary circuit opens when the banking sector extends credit, thus creating purchasing power *ex-nihilo*, to the firm sector. This is called *initial finance*. The newly created money is used to initiate production by hiring labor. Assuming the cost of production for the firm sector is only equal to the wage bill, the amount borrowed by firms is then equal to the wage bill (the assumption that firms only borrow to cover the wage bill is relaxed later). Workers, after being paid, decide on how to split their wages between consumption and saving. The consumption expenditures flow back to firms in the form of profits, while savings are split between deposits and securities issued by firms. If workers do not spend their whole income, profits earned by firms are not enough to extinguish all of their outstanding loans. Thus, securities are issued to attract the savings of workers. This is called *final finance*. If enough savings are attracted, firms can then pay back their loans. The construction of this simplified circuit does not allow for interest to be paid. This problem can be alleviated by assuming further that firms borrow enough to cover interest payments as well, or by allowing other sectors to borrow as it is done later. When loans are repaid it is also implied that money, initially created by the banking system by extending credit, is destroyed and the monetary circuit closes. In this circuit, though, firms cannot make their interest payments.

The above discussion requires some further remarks. Money in the monetary circuit is endogenously created when loans are extended. It is not exogenous, as implied by conventional monetary theory which states that the money supply is exogenously determined by monetary authorities. Moreover, as the banking system along with firms decide on the amount of production to be undertaken, and firms, in turn, fix their prices, money cannot be neutral. As firms have the privilege of easier access to credit and can decide on the amount of product to be produced and on how national income is distributed by fixing their prices, money is not just a veil but rather “at the economic level, a source of profits and, at the social level, a source of power” (Graziani, 2003, p. 26).

Money, Debt and Financial Fragility

The previous points emphasized that money is created in accordance to the needs of production and that access to credit is necessarily a source of social power. One might

argue that if the financial system provides credit to the firm sector for production purposes, then society benefits as a whole from the increasing availability of consumption and investment goods. But as mentioned previously, firms have the power to fix their prices, and thus the distribution of income. Allowing for limited access to credit for workers (something that Graziani rules out), the fixing of prices above the cost of production, and thus the wage bill, forces workers to borrow, if they want to save, and if all consumer goods are to be purchased. Marx also made this point in his work (*Capital*, Volume 2; Chapter 17) by asking “how can the entire capitalist class manage to draw continuously £600 out of circulation, when it continuously throws only £500 into it?”. Thus, in absence of a government and foreign sector, debt is a prerequisite for production to both take place, in the first place, and for production to keep growing. Households, though, cannot go into debt indefinitely to consume, a truth the world learned the hard way with the recent financial crisis.

Debt in the Monetary Theory of Production of Graziani only serves the purpose of allowing the production of consumer and investment goods. As discussed in the previous sections, financialization, however, has altered the behavior of both firms and households. Firms, under the influence of agency theory, have the sole purpose of maximizing shareholder value each year, a short-term goal that is most often realized through financial investment. Households, on the other hand, are resorting more and more to credit. Modern economies are thus no longer operating under the regime described by Graziani and debt is not used solely for the purpose of production and has contributed to more financial investment and excess household consumption, in the face of stagnating wages.

This “debt shift”, as Bezemer (2016; 2017) has described it, from the provision of credit to businesses towards the provision of credit to the FIRE sector may be contributing to the increased fragility of sector balance sheets. Hyman Minsky in his “Financial Instability Hypothesis” (1992) emphasized how the financial structure of an economy endogenously changes as the business cycle progresses and economic agents begin to disregard risk by increasing their leverage. The increase in leverage of the system is used to finance more risky activities in the search for higher returns, and thus shifts towards a “Ponzi” finance state.

A financialized Monetary Circuit

The institutional and behavioral changes of both households and businesses along with financial markets are important in the analysis of financialization. They cannot be explicitly derived from the traditional circuit of Graziani, though. Thus, in order to construct the financialization indicators for this paper, it is vital that the original circuit is expanded to reflect the current financialized monetary economy. A depiction of such a circuit (without a government and foreign sector) is shown in Figure 3.

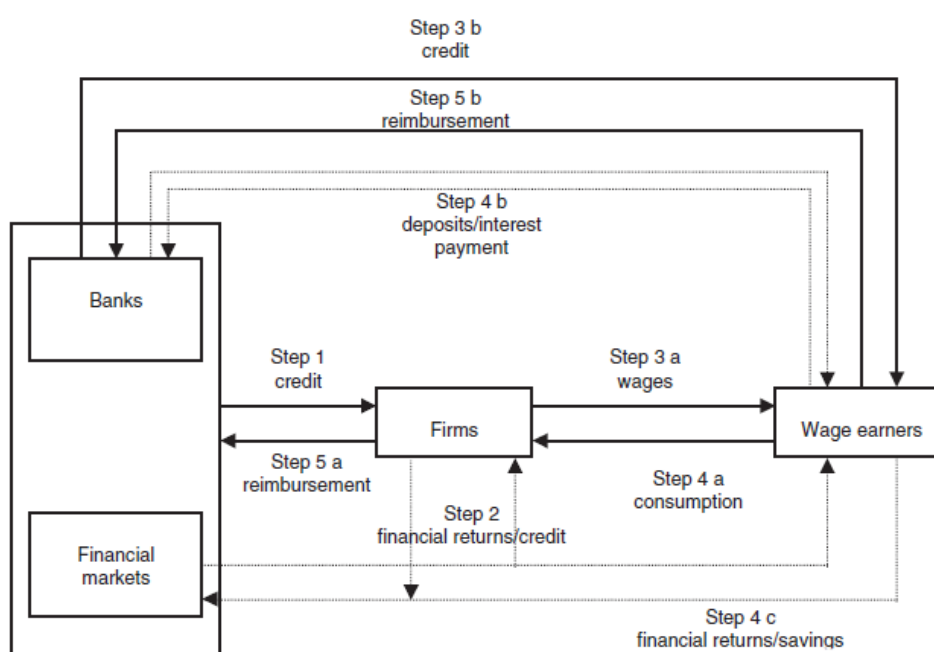


Figure 3 – Financialized Monetary Circuit
reprinted from Fumagalli & Fucarelli (2011)

The financialized circuit differs from the original one in several ways. Wage earners now have access to bank credit lines. Moreover, households can use their savings to invest in existing financial assets or they could potentially borrow to acquire financial assets. Thus, in a financialized economy, households can sustain their consumption and capital formation via credit, in the face of stagnating real wages, or via capital gains from financial assets transactions. Firms can also choose to invest in financial assets as a means to maximize profits for their shareholders, while they also have the ability to gain access to credit via financial markets to repay bank loans and interest payments. While

capital formation is usually financed via retained profits, firms could potentially use debt as higher leverage translates into higher returns on equity. Figure 2 and 3 do not explicitly show capital formation as a firm's main activity. This is due to the fact that investment activity implies the purchasing of materials from other firms. The monetary circuit deals with an aggregated firm sector thus it makes sense that the biggest monetary flow of the sector towards the rest of the economy is the wage bill, the repayment of debt and investment in financial markets.

The financialized circuit encloses banks and financial markets in a single box. This is intentional as it seeks to emphasize the “blurry” line between financial institutions such as banks and non-bank financial institutions in modern economies. This weak distinction between the banking sector and financial markets relates to the shift from the traditional banking model, of taking in deposits and providing loans, to the “originate and distribute” model discussed earlier in this paper. The financial sector itself actively creates, and trades, financial assets and invests little in the real economy via capital formation.

While the government and the foreign sector are not depicted in Figure 2 and 3, their operations are described since they are included in the empirical part of the paper. The government levies taxes on households and business, and funds deficit spending via bonds, which are bought by households and financial institutions. The government can either invest in capital formation or provide subsidies to domestic sectors. In turn, the foreign sector cannot pursue capital formation in the domestic economy and only invests in domestic financial markets.

This version of the circuit can theoretically “predict” how income distribution is affected by financialized sector behaviors. As corporations have shifted towards profit maximization for shareholders, investment in physical capital has been sluggish, with brief bursts driven during the boom of the 2000s and after the financial crisis. If corporate finance is mostly poured into financial investments, this puts upward pressure on asset prices and creates capital gains for asset holders. Moreover, the widespread “adoption” of agency theory requires CEO pay to be linked to stock performance. Thus, the upward trend of asset prices also pushes up CEO pay. If real

wages are barely moving, income and wealth disparities should be worsening, as financial asset inflation benefits managers and investors. Furthermore, the significant accumulation of debt implies increasing interest payments which reduce net disposable income, putting downward pressure on consumption while making household and corporate balance sheets more fragile. These increasing interest payments accrue to financial institutions, who pass a significant part of their earnings to stockholders, or individual investors. Such a process automatically entails a widening of income and wealth disparities. Lastly, the financial sector itself has bolstered the financialization process by supporting asset price inflation via extending credit more to the FIRE sector than the real economy. Based on these theoretical observations/hypotheses (outlined in Figure 1 as well), the next part constructs indicators of the financialization process based on circuit theory and sector balances data in order to empirically test whether financialization negatively affects income distribution.

The “new” measures of financialization

The indicators of financialization chosen for this paper are based on sector balances data. Sector balances are broken down into sectoral financial transactions and non-financial transactions. Non-Financial transactions include items such as gross savings, gross disposable income, final consumption expenditure, net lending, net saving and gross capital formation for each sector and for the total economy. Financial transactions include sectoral net accumulation of financial assets, net incurrence of financial liabilities, equity, deposits, loans, and securities among others.

By using the financialized circuit, each sector’s transactions can be broken down into financial flows that mirror real sector transactions, such as gross capital formation and consumption, and financial flows for financial investments, such as acquiring equity, derivatives, and securities. From the actual data, such a distinction is not completely clear. The net incurrence of liabilities of each sector are not broken down into the transactions they fund. This paper attempts to create proxies for the financial flows that go into existing financial and real estate assets.

Each sector incurs debt or disposes of financial assets for gross capital formation, or in the case of households for final consumption as well. Gross capital formation includes

the formation of fixed capital, the purchases, or renovation, of existing dwellings\houses, and the net acquisition of non-financial non-produced assets and disposables. Final consumption expenditure is the aggregated purchases of goods and services by households and/or NPISHs for consumption purposes. If part of the financial transactions is the “mirror image” of non-financial transactions, then subtracting non-financial flows from the net incurrence of liabilities should result in an estimate of financial transactions related to financial purposes. In this case, gross capital formation is chosen to be subtracted from net financial liabilities, as it is aimed at expanding the production of goods and services and the productive capacity of an economy. This indicator is not an ideal proxy for financial transactions, due to the fact that not all non-financial transactions can be measured and subtracted from the net incurrence of liabilities.

The second indicator for financialization that is used relates to the idea that the financial system “connects” deficit units to surplus units. In the monetary circuit, household savings are deposited in the banking system or invested in the financial system via the purchases of corporate bonds. Thus, surplus funds from the household sector are “transferred” to the firm sector that is in deficit via the financial system. In each period, if deficit (surplus) units are borrowing (lending) in excess of their deficit (surplus), though, these flows could be seen as “excess financial flows”, as they might signal increasing financial investment. Each sector does not borrow (lend) just to cover (shrink) its deficit (surplus), though. Households borrow to purchase houses, for example, an activity that cannot always be considered speculative or an “excess” financial flow. Thus, to use such financial flows as an indicator for financialization, it is assumed in this paper that any borrowing (lending) above a sector’s deficit (surplus) is channeled into existing financial and real estate assets. If households are repaying mortgages and thus are paying down liabilities, this measure should turn negative. Since the pre-financial crisis boom was accompanied by a real estate bubble for certain countries, the indicator *Excess Financial Flows*, or *EFF*, is also regressed on an index of real house prices and a measure residential investment in terms of GDP to empirically test whether a large, or a small part, of the borrowing (lending) by households in excess of their sectoral deficit (surplus) was directed into real estate assets.

Finally, most firms finance investment through retained profits and thus it is expected that business debt is lower than investment. If profits are present, the incurrence of debt must be for reasons other than real investment, such as financial investment. The indicator, *Debt for financial investment*, or *DebtFI* compares the level of business debt to the level of investment for each year. If debt at the end of each period is higher than gross capital formation, then this could imply that credit is used mostly for investment in existing financial assets. By making the assumption that non-financial firms prefer to raise debt than to use retained earnings for their activities as to maximize returns on equity, then by subtracting gross capital formation from each period's debt, it is possible to proxy corporate financial investment. Assuming away the utilization of internal finance is not very realistic and, as stated before, gross capital formation is an imperfect proxy for real sector transactions, but it is interesting to see whether a different measure of accumulated liabilities, rather than the net incurrence indicator utilized in the first proxy, also influences income inequality.

III. Methodology

The main purpose of this paper is to analyze the relation between income inequality and financialization using a panel regression with quarterly data from 1999-2016. Several control variables that can affect income inequality are utilized. The model is as follows:

$$(1) \text{INEQ}_{it} = \alpha + \beta \text{FIN}_{fit-1} + \gamma X_{it} + \mu_i + \epsilon_{it}, \quad i = 1, \dots, N; t = 1, \dots, T$$

Where INEQ_{it} is the market GINI or the net disposable GINI for income inequality in country i at time t ; FIN_{fit-1} is a matrix of financialization indicators, denoted f , based on financial and non-financial transactions data from Eurostat, including *BEI*, which is a proxy for borrowing of each sector in excess of gross capital formation; *EFF*, which proxies borrowing (lending) in excess of a sector's net borrowing (lending) position and *DebtFI* which proxies financial investment by non-financial firms. X is a matrix of control variables such as union density, government consumption, trade openness, the output gap, unemployment, inflation, GDP per capita and the wage share. μ_i are country

specific effects; ϵ_{it} is an independently and identically distributed error term with mean 0.

All the indicators for financialization will be included with a one-year lag to take into account potential reverse causality and endogeneity. In panel analysis heteroskedasticity and autocorrelation are a problem. Heteroskedasticity implies that the variances for all observations are not the same. As a result, computed standard errors are incorrect and inferences are misleading. Autocorrelation arises if the error terms exhibit correlation over time. The consequences of having autocorrelated variables or errors are the same as with heteroskedasticity; standard errors are incorrect. Thus, prior to any analysis, the data are tested for heteroskedasticity and autocorrelation, and the baseline model uses the Newey West panel estimator to deal with these phenomena. Moreover, data for financial flows and inequality are suspected to have an upward trend. Thus, stationarity might be an issue. As such, panel stationarity tests are run for all the variables. If certain variables are found to have unit roots, estimation results might be spurious.

While the panel is strongly balanced it is short as $T = 68$ and $N = 13$. As a result, the effects of the dot-com bubble in the early 2000s and the financial crisis of 2007-2008 might affect the results due to trends or outlier years. To account for this, the data are tested for structural breaks via a Chow test and a dummy variable is added to account for shifts in the trends of the variables after the financial crisis. Moreover, dummies for 2000-2002 are used to account for the dot-com bubble years during which both financial and non-financial corporations show an upward trend in their financial transactions during the boom and sharp drops during the deflation of the bubble.

Even though this dataset includes countries from the EU, significant differences exist between nations in terms of economic size and institutions. To partly account for that, union density is added as a control variable. Union density is seen as a proxy for institutions that could act a mitigating factor for the effects of financialization on income inequality. Furthermore, the data show that Ireland has larger financial flows in comparison to the rest of the sample. To control for the potential effects of such an “outlier” on the estimations, the models are re-estimated without Ireland in the data. Finally, panel estimation assumes that marginal changes of independent variables have

the same effect on the dependent variable in each country. Thus, regression estimates should be seen as average effects.

IV. Data Analysis

Data and Variables Description

All quarterly data are for the period of 1999-2016 and are seasonally adjusted. The specific years used were chosen due to the availability of data, though there are some missing observations for certain countries. The financial and non-financial transactions data obtained by Eurostat Quarterly Sector Accounts. The indicators for income inequality chosen are the market GINI and the P5-P95 percentiles. The market GINI was chosen so the effects of financialization on a raw inequality measure are obtained. The percentiles are utilized as it is interesting to see which income groups are affected more by increased financial flows. The data for the inequality indicators were obtained via the Standardized World Income Inequality (SWIID) and the UN World Income Inequality Database (WIID). Due to the lack of quarterly data for such variables, quarterly values are linearly interpolated as income shares and the GINI index do not experience volatile changes over short time periods.

As in every estimation, there is a big possibility that business cycle movements might be reflected in the results. This is controlled for by dummy variables for the 2001-2002 recession and the financial crisis, but control variables are also utilized. Output gap data for each country along with respective unemployment rates are used to counteract business cycle effects. Output gap data were sourced from the European Commission's AMECO database and the unemployment rates were obtained by the World Development Indicators tables of the World Bank.

Income inequality can be influenced by various other variables. Inflation can put upward pressure on wages for certain sectors but not for others, widening disparities in income (Kus, 2012). Government consumption might increase or decrease income inequality depending on the sectors or income groups expenditures are targeted at (Heshmati & Kim, 2014). Trade openness has been linked to higher income inequality as higher

skilled labor benefits more from more trade or tradable sector wages rise faster than non-tradable sector wages (Milanovic, 2016). Lastly, economies with a higher wage share of national income and high trade union density usually experience less income inequality. As such, commonly used controls in the inequality literature, such as GDP per capita, inflation, government consumption, trade openness, the wage share, and trade union density along with others are added as control variables. The data for the discussed variables are obtained via the World Bank’s World Development Indicators database.

Trends and Outliers for Income Inequality and Financialization

Figure 4 shows how income inequality measured via the market GINI has developed over the years 1995-2015. The GINI index in the figure is the unweighted mean of 15 EU countries. The index was relatively stable from 1995-2000, increased a bit after 2000, then stabilized again until 2005 when it started an uninterrupted upward trend. Overall, income inequality according to the market GINI has been increasing over time throughout the last 20 years, though the rise from 0.32 to 0.34 is marginal. Similar upward patterns are evident when plotting individual GINI indexes, as well.

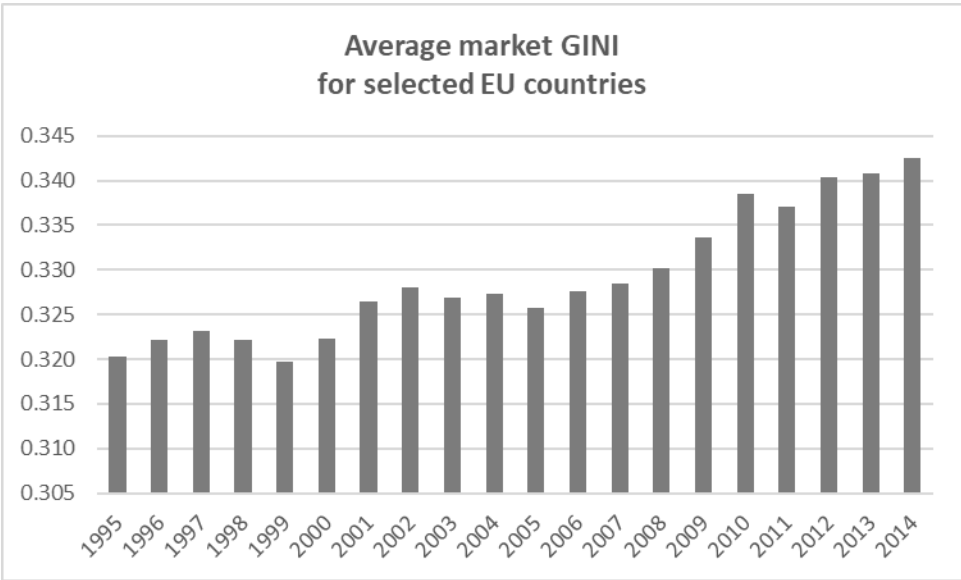


Figure 4 – Average Market GINI for EU countries
(SWIID and author’s calculations)

While this paper explores how financial flows of each sector, aimed at purchasing existing financial assets, affect income inequality, there are certain sectors, and countries, that display remarkably large flows in comparison to the rest. The two sectors with the largest *Borrowing Exceeding Investment* (as % of GDP) are Financial Firms and the Rest of World (ROW) as shown in Figure 5 and 6.

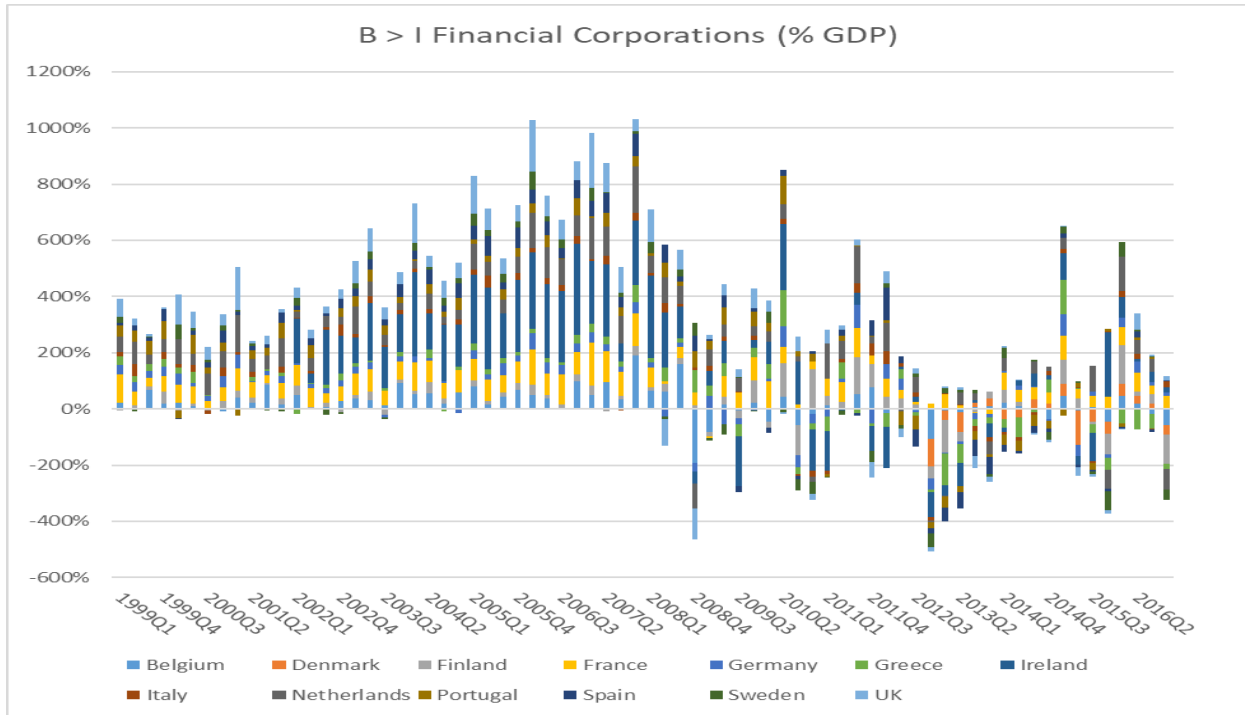


Figure 5 - Borrowing Exceeding Investment Financial Firms
(Eurostat and author's calculations)

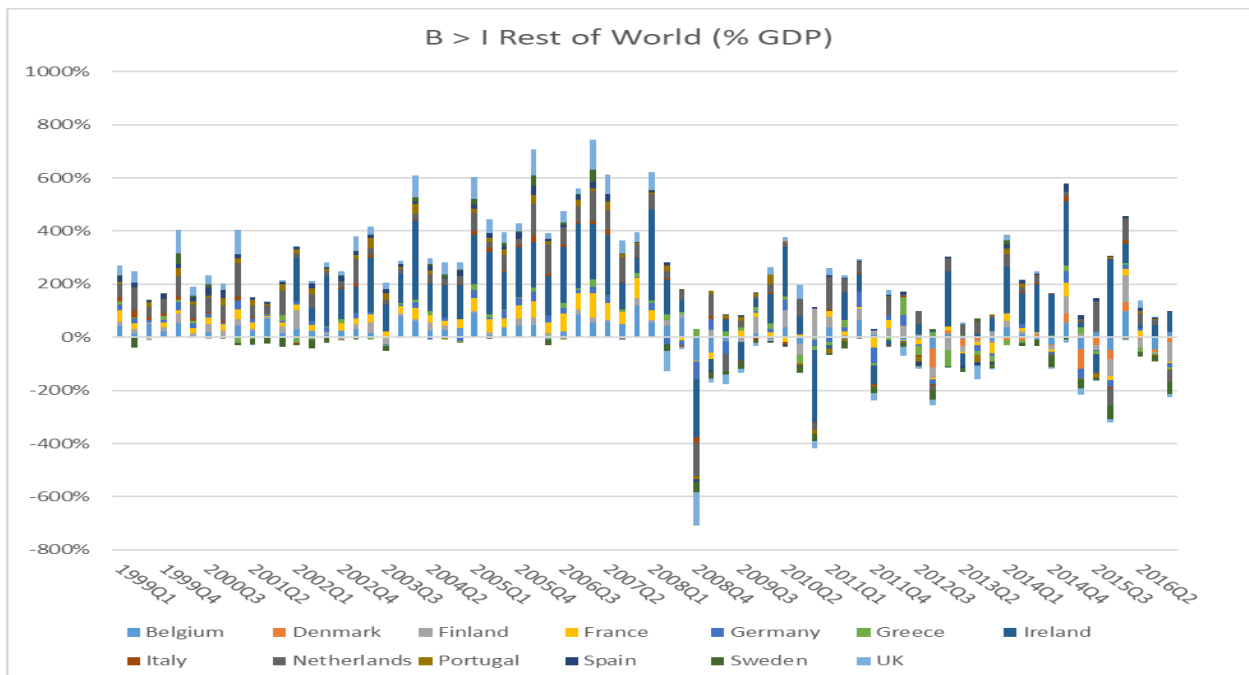


Figure 6 - Borrowing Exceeding Investment Rest of World
(Eurostat and author's calculations)

From 1999 until 2008, financial firms were incurring net liabilities in the magnitude of multiple times the size of GDP. These are quarterly flows relative to quarterly GDP. After the Crash, these flows were scaled down “massively” and have stabilized at around 200% of GDP. This can be attributed to the immense slowdown and subsequent weak recovery of the global economy and especially the EU where many countries suffered prolonged downturns due to sovereign debt crises. A similar pattern is evident with financial inflows from the Rest of World. Rest of World flows are enormous on account of not reflecting only trade flows but also inflows to purchase financial instruments. There is one country in this sample that is a big outlier, Ireland. Ireland is a hub for multinational companies and has a very large banking system in comparison to its GDP. These two institutional factors might explain the massive financial flows stemming from their financial sectors and the rest of the world.

In order to verify the change in the trend of the aforementioned flows, a Chow test is utilized to test the existence of a structural break after the second quarter of 2007. For all the models, the Chow test returns a p-value of approximately 0 confirming the hypothesis of a structural break (see Appendix for detailed results).

Diagnostic tests

In order for the estimation results to be reliable, the data have to “obey” certain assumptions. As mentioned before, heteroskedasticity is an issue in panel estimations. If the variances of residuals are not constant, then computed standard errors are incorrect and inferences are impossible. To test the data for heteroskedasticity, a modified Wald test is employed. This test calculates a statistic for groupwise heteroskedasticity in the residuals of a fixed effect model. The results for each model are outlined in the Appendix of this paper. All models have a p-value of 0.05 or lower indicating that residuals are heteroskedastic.

Moreover, serial correlation is also a common phenomenon in time series data when variables in the model or omitted variables in the error term exhibit correlation over time. The existence of serial correlation is tested using the Wooldridge test. Each model has a p-value of 0 and thus the null hypothesis of no serial correlation is rejected. The

details of each test can be found in the appendix. Both heteroskedasticity and serial correlation are simultaneously controlled for by utilizing the Newey West estimator.

Furthermore, multicollinearity could potentially cause problems. If two or more independent variables are highly correlated, standard error, or/and coefficient signs, are affected. Farrar & Glauber (1967) states that multicollinearity only poses a problem if the correlation coefficient between two variables is more than 0.8. To test for the existence of collinearity, the Variance Inflation Factor test is usually employed but this can only be used for OLS regressions. As this paper utilizes panel data, a correlation matrix is calculated (the matrix can be found in the Appendix). High and significant correlations are found between sector-specific BEI (Borrowing exceeding Investment) and EFF (Excess Financial Flows) indexes and between the RoW (Rest of World) and FC (Financial Corporations) sector. To deal with this, the sectors are broken down to the *Real Sector* (Households, Non-Financial Corporations, and General Government), the *Financial Sector* (Financial Firms), and *Rest of World*. Moreover, each model is estimated twice, once with the BEI index and once with the EFF index to avoid multicollinearity issues. Squared terms of the financialization indexes are also employed to test for the existence of non-linear relations with income inequality indexes. While a variable and its squared term are possibly collinear, Goldberger (1991) states that such multicollinearity can be ignored if it caused by the inclusion of non-linear functions of variables as the effects of both simultaneously are considered and not the effects of each one independently. Moreover, multicollinearity is about the *linear* relationship between independent variables, thus non-linear functions of variables are not a concern.

Finally, stationarity is an assumption that needs to be satisfied to avoid spurious results in time series datasets. Stationarity implies that variables have a constant covariance and thus always fluctuate around a long-term mean. If this does not hold, then estimation results and inferences are unreliable. In order to determine whether the stationarity assumption holds, each variable is tested using the Im-Pesaran-Shin unit-root test. The detailed results can be found in the appendix. The Gini index, along with the P5-P95 shares and certain control variables contain unit roots. The literature on the topic of income inequality does not follow any specific procedure to deal with potential unit roots in the inequality measures. This might be due to the argument made by Baltagi (2013) that “unlike the single time series spurious regression literature, the

panel data spurious regression estimates give a consistent estimate of the true value of the parameter as both N and T tend to infinity”. This is due to the fact that panel data estimators average across individuals/countries, thus unit roots are less of a concern. Moreover, in small datasets, as the one in this paper where T = 68 and N = 13, unit root tests have a low predictive power. Thus, their results need to be treated with caution. In the literature review, most authors use the Gini index as it is. The current paper will follow the literature by employing the GINI the P5-P95 shares in the raw format. The control variables that are non-stationary are also left as is considering that they are not the main focus of this paper.

V. Empirical Results

In this section, the results of the empirical models are discussed. Due to a structural break being found, the models are run using dummies for the crisis years and for the 2001-2002 downturn. Moreover, the models are run for three sectors, the real sector, the financial and the rest of world.

Estimation results

Table 1 outlines the results of regressing the BEI, EFF and DebtFI indicators on the market GINI index. The Newey-West estimator does not calculate an R^2 but the F-test for the models suggests that all models are significant. The specifications (1), (3), (5) show the results of the model when utilizing the BEI² and DebtFI indicators, while (2), (4), (6) refer to the specifications that utilize the EFF and DebtFI indicators. All results will be analyzed more thoroughly in the discussion section.

² Financial Firms, along with the Rest of World sector, do not actually carry out real investments. Their BEI indicator was constructed by subtracting acquisitions less disposals of non-financial non-produced assets, such as land, which is a proxy for the non-financial real transactions these sectors carry out.

Table 1: Regressions of BEI, EFF and DebtFI measures on market GINI inequality index

	Market Gini		Market Gini		Market Gini	
	Real sector		Financial Firms		Rest of World	
	(1)	(2)	(3)	(4)	(5)	(6)
L4_Household BEI	-.0327 (.020)	-	-	-	-	-
L4_Household BEI ²	.305* (.15)	-	-	-	-	-
L4_Household EFF	-	-.13*** (.026)	-	-	-	-
L4_Household EFF ²	-	.39*** (.13)	-	-	-	-
L4_Government BEI	.050*** (.011)	-	-	-	-	-
L4_Government BEI ²	-.033 (.022)	-	-	-	-	-
L4_Government EFF	-	.013 (.009)	-	-	-	-
L4_Government EFF ²	-	-.013 (0.025)	-	-	-	-
L4_Non-Financials BEI	-.007 (.006)	-	-	-	-	-
L4_Non-Financials BEI ²	-.0001 (.014)	-	-	-	-	-
L4_Non-Financials EFF	-	-.0098 (.007)	-	-	-	-
L4_Non-Financials EFF ²	-	.0034 (.015)	-	-	-	-
L4_Debt for Financial Investment	-.016 (.014)	-.022 (.014)	-	-	-	-
L4_Debt for Financial Investment ²	.14** (.007)	.018*** (.006)	-	-	-	-
L4_Financials BEI	-	-	-.0067** (.002)	-	-	-
L4_Financials BEI ²	-	-	.0064*** (.0015)	-	-	-
L4_Financials EFF	-	-	-	-.0064** (0.002)	-	-
L4_Financials EFF ²	-	-	-	.0063*** (.001)	-	-
L4_Rest of World BEI	-	-	-	-	-.0064*** (.0024)	-
L4_Rest of World BEI ²	-	-	-	-	.0061*** (.0015)	-
L4_Rest of World EFF	-	-	-	-	-	-.0055** (.0023)
L4_Rest of World EFF ²	-	-	-	-	-	.006*** (.0015)
Gov. Consumption (% GDP)	-.067** (.031)	-.074** (.032)	-.066** (.026)	-.066** (.026)	-.067** (.028)	-.067*** (.028)

Inflation	-.29 (.108)	-.17 (.11)	-.25** (.095)	-.25** (.095)	-.24** (.096)	-.24** (.096)
Trade Openness	.004 (.004)	.0042 (.004)	.008** (.004)	.008** (.003)	.010*** (.0037)	.0099 (.0037)
Output Gap	.060*** (.011)	0.067*** (.011)	.054*** (.010)	0.54*** (.010)	.055*** (.011)	.055*** (.011)
Log GDP per capita	-.012*** (.004)	-.016*** (.004)	-.012*** (.004)	-.0123*** (.004)	.012*** (.0043)	-.021*** (.0043)
Union Density	-.018*** (.005)	-.019*** (.005)	.020*** (.005)	-.0205*** (.0052)	-.021*** (.005)	-.020*** (.0052)
Wage Share	.022 (.031)	.035 (.032)	.046 (.029)	-.047 (.029)	.035 (.027)	.038 (.028)
Unemployment	.070*** (.032)	.05 (.033)	.15*** (.024)	.153*** (.024)	.15*** (.025)	-.15*** (0.032)
Dummy 2001	-.0025 (.0039)	-.036 (.0038)	-.004 (.0037)	-.0041 (.0037)	-.0041 (.0038)	-.0041 (.0038)
Dummy 2002	-.0039 (.0038)	-.0051 (.003)	-.0045 (.0037)	-.0046 (.0037)	-.0046 (.0038)	-.0046 (.0038)
Crisis Dummy	.0026 (.0032)	.002 (.003)	-.0007 (.002)	-.0007 (.0029)	-.0002 (.0030)	-.0002 (.0030)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	19.16***	20.45***	22.05***	21.69***	20.04***	20.04***
Observations	721	721	721	721	721	721
Countries	13	13	13	13	13	13

*Notes: The dependent variable here is the market GINI. Specifications (1), (3), (5) utilize indicator BEI while (2), (4), (6) utilize indicator EFF. Debt for Financial Investment is used only in (1) and (2)
*** $p < .01$, ** $p < .05$, * $p < .10$. Newey West standard errors are reported in parentheses.*

In specification (1) government borrowing in excess of government capital formation has an overall negative and significant impact on income inequality. While the squared term is insignificant, an F-test of both terms shows that they are jointly significant at the 1% level. The non-linear effect of government borrowing could be attributed to the fact that government spending takes time to produce the desired effects. If an omitted variable is pushing up the GINI index, government BEI might react but only slowly counteract the rise in inequality. The fact that borrowing in excess of investment takes place for the government sector might sound strange. It is assumed here that borrowing, instead of taxes, finances public investment. Any net accumulation of liabilities by the government that do not fund real investment could be attributed to cyclical fluctuations and the sectoral behavior of other sectors that affect the public-sector balances.

Borrowing in excess of real investment by non-financial firms seems to put downward pressure on income inequality. The effect of the BEI indicator, though, is insignificant. Debt raised by non-financials for financial investments, in comparison to the borrowing exceeding investment, raises income inequality. This could possibly be attributed to

non-financial firms trying to increase their profits through financial investments. If this comes at the cost of actual investments in real assets, downward pressure is put on productivity and wages.

Turning to the control variables, an increase in the output gap puts upward pressure on the Gini in all the specifications of the model, as does unemployment, possibly due to the unequal distribution of income losses in a downturn. The higher government consumption is in terms of GDP the larger the lower GINI is in every case, as this measure might represent social spending. Trade openness almost always pushes inequality upwards confirming the findings of some of the literature on the trade-income inequality nexus, though the effects are significant only in three out of the six runs of the model. A higher union density is always associated with lower inequality as strong unions protect employees and negotiate for “fair” wages. Finally, inflation most of the time has a significant positive effect on income inequality while a higher initial level of GDP per capita is associated with a lower GINI. The coefficient of inflation though is unrealistically high in five out of the six specifications. This might have to do with inflation been measured as the quarterly percentage change in consumer prices and not via a CPI index.

Specification (2) examines the effects of excess financial flows on the GINI coefficient. Household borrowing (lending) in excess of sectoral needs has a statistically significant impact and overall it pushes up the GINI index. Excess financial flows from the government sector do not affect income inequality. The same holds for non-financial firm’s borrowing (lending) in excess of their sectoral net position. The DebtFI proxy for financial investment in this specification is again significant thus providing additional evidence that financial investments by non-financial firms increase inequality.

Financial flows and borrowing in excess of investment by financial firms seem to have a positive but overall weak effect on the GINI. The same phenomenon is evident with the rest of world financial flows and borrowing aimed at acquiring financial assets have an increasingly positive impact on the GINI.

The rather small effects of the financialization indicators on the GINI index might be due to the slow response of income inequality measures to changes in the financial structure. Even though all specifications employ 4 lags for the financialization indicators, the effects might take even longer to show up in the GINI measure. Moreover,

the GINI is an imperfect indicator so in response, this paper also estimates the previously employed specifications by utilizing the P5 and P95 measures as dependent variables. While income percentiles are not a direct indicator of income inequality, it is still possible to make inferences by looking at how the financialization indicators impact the specific income shares. If the estimates show that sectoral financial flows are pushing up the income share of the top 5% of the population while decreasing the income share of the bottom 5%, this might indicate that financialization widens income disparities.

Table 2 shows the effects of the financialization indicators on the 5th percentiles income share. Once again the equations (1), (3), (5) show the results of the model when utilizing the BEI and DebtFI indicators, while (2), (4), (6) refer to the specifications that utilize the EFF and DebtFI indicators.

In specification (1) borrowing exceeding capital formation of most sectors of the real economy does not seem to have a statistically significant effect on the income of the poorest 5% of the population. The BEI measure for households³ has an overall negative effect on the 5th percentile's income. This might be due to the fact borrowing directed at acquiring financial and real estate assets allows households to accumulate wealth/savings. But debt accumulation also means a lower net disposable income as interest payments go up. This might translate into lower bargaining power for workers leading them to accept low paying jobs just to pay off their accumulated liabilities. Interestingly, both the financial firms' and the rest of world borrowing in excess of real investment and their sectoral excess financial flows seem to have a small but nonetheless positive and statistically significant impact on the 5th percentile's income. This is an unexpected result considering only a small part of the population are employed by the financial sector or own financial and real estate assets.

³ Household capital formation here refers to the purchases of durables or renovation of houses for example. See UN System of National Accounts (2008) for a detailed explanation of what is counted as capital formation in each sector.

Table 2: Regressions of BEI, EFF and DebtFI measures on 5th Percentile

	P5		P5		P5	
	Real sector		Financial Firms		Rest of World	
	(1)	(2)	(3)	(4)	(5)	(6)
L4_Household BEI	.0015 (.002)	-	-	-	-	-
L4_Household BEI ²	-.044*** (.016)	-	-	-	-	-
L4_Household EFF	-	.0049* (.0026)	-	-	-	-
L4_Household EFF ²	-	-.045*** (.0147)	-	-	-	-
L4_Government BEI	-.0018 (.0011)	-	-	-	-	-
L4_Government BEI ²	.0037 (.0024)	-	-	-	-	-
L4_Government EFF	-	-.00061 (.0011)	-	-	-	-
L4_Government EFF ²	-	.0056** (.0028)	-	-	-	-
L4_Non-Financials BEI	.0015** (.0007)	-	-	-	-	-
L4_Non-Financials BEI ²	-.0034* (.0020)	-	-	-	-	-
L4_Non-Financials EFF	-	.0033*** (.0010)	-	-	-	-
L4_Non-Financials EFF ²	-	-.0044** (.0020)	-	-	-	-
L4_Debt for Financial Investment	.0027 (.0016)	.0029** (.0014)	-	-	-	-
L4_Debt for Financial Investment ²	-.0007 (.0007)	-.0010 (.00067)	-	-	-	-
L4_Financials BEI	-	-	.00078*** (.0002)	-	-	-
L4_Financials BEI ²	-	-	.00011 (.00010)	-	-	-
L4_Financials EFF	-	-	-	.00075*** (.00023)	-	-
L4_Financials EFF ²	-	-	-	.00013 (.00010)	-	-
L4_Rest of World BEI	-	-	-	-	.0009*** (.00023)	-
L4_Rest of World BEI ²	-	-	-	-	.0001 (.00011)	-
L4_Rest of World EFF	-	-	-	-	-	.00093*** (.00022)
L4_Rest of World EFF ²	-	-	-	-	-	.00010 (.00010)
Gov. Consumption (% GDP)	.010*** (.0023)	.0099*** (.0023)	.0112*** (.0024)	.0113*** (.0024)	.0115*** (.0025)	.0116*** (.0025)

Inflation	-0.002 (.0095)	-0.0048 (.0096)	-0.0042 (.0091)	-0.0039 (-.0091)	-0.0013 (.009)	-0.0013 (.0091)
Trade Openness	-0.00013 (.0004)	-0.0002 (.0004)	-0.00025 (.00038)	-0.00026 (.00038)	-0.00038 (.00039)	-0.00037 (.00039)
Output Gap	-0.006*** (.0012)	-0.0070*** (.0012)	-0.0062*** (.0012)	-0.0062*** (.0012)	-0.0005*** (.0012)	-0.00058*** (.00124)
Log GDP per capita	.0040*** (.0005)	.0039*** (.005)	.0041*** (.0005)	.0041*** (.0005)	.0042*** (.0005)	.0043*** (.00051)
Union Density	.0025*** (.0008)	.00262*** (.0008)	.0036*** (.008)	.0036*** (.008)	.0033*** (.008)	.0033*** (.0083)
Wage Share	.013*** (.0030)	.0118*** (.0029)	.018*** (.0026)	.018*** (.0026)	.018*** (.0027)	.0180*** (.0026)
Unemployment	-0.019*** (.0033)	-0.0204*** (.0034)	-0.016*** (.0028)	-0.016*** (.0029)	-0.0164*** (.0028)	-0.0165*** (.0028)
Dummy 2001	.0010** (.00041)	.0010** (.00041)	.0010** (.00041)	.0010** (.00041)	.00095** (.0004)	.00096** (.0004)
Dummy 2002	.0006 (.00045)	.0006 (.00045)	.00059 (.00046)	.00050 (.00046)	.00045 (.00046)	.00046 (.00046)
Crisis Dummy	-0.00004 (.00033)	-0.00008 (.00033)	-0.00012 (.00032)	-0.00012 (.00032)	-0.00007 (.00032)	-0.00007 (.00032)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	32.02***	34.72***	46.83***	46.99***	40.54***	41.03***
Observations	721	721	721	721	721	721
Countries	13	13	13	13	13	13

*Notes: Dependent variable is the 5th percentile's income share. Specifications (1), (3), (5) utilize indicator BEI while (2), (4), (6) utilize indicator EFF. Debt for Financial Investment is used only in (1) and (2) *** $p < .01$, ** $p < .05$, * $p < .10$. Newey West standard errors are reported in parentheses.*

In specification (2) of the model, all financialization indicators and their non-linear terms are jointly statistically significant at the 5% levels. Household excess financial flows put downward pressure on the 5th percentile income as before. The EFF indicator for non-financial corporations has a negative sign while the DebtFI has a positive sign. This is counterintuitive as both measures are proxies for financial investments by non-financials. It was expected that DebtFI would also put downward pressure on the income of the poorest 5% since borrowing for financial investments is supposed to be a source of profits for shareholders but comes at the expense of long-term real investments. While it might seem odd to include an EFF measure for the government sector, it does make sense that borrowing does not take place only to cover deficits. Debt might be issued for monetary policy purposes or to fund assistance packages for the banking sector during crises. This indicator seems to support the 5th percentile income. Such an effect might be attributed to the fact that government debt to fund deficit spending always acts as a countercyclical buffer, supporting employment and income during downturns.

When it comes to the control variables, inflation is always insignificant while GDP per capita is always positively related to the 5th percentile's income. Moreover, union density and the wage share have the expected positive impact on the poorest population's income. Unemployment and the output gap always decreases the income of the poorest 5%. While trade openness has a negative impact, its effect is statistically insignificant in all specifications.

Table 3 outlines the results on how borrowing in excess of capital formation and excess financial flows affect the income share of the richest 5% of the population. A joint significance test cannot reject the null hypothesis that household borrowing in excess of gross capital formation, along with borrowing from non-financials do not have an impact on the 95th percentile income share. Excess borrowing by the government seems to support the income of the richest 5% in a positive way. This might be reflecting subsidies and other support for the richest percentile that are funded by this borrowing during downturns. Such policies worsen income disparities. In specification (2) only household EFF has a statistically significant impact on the richest 5% income share. The magnitude of the effect is unrealistic, though as an increase of excess financial flows by 1 percentage point in terms of GDP raises the 95th percentile income share by 0.35.

The control variables have the opposite effects on the 95th percentile than they did for the 5th percentile. Union density decreases the income of the richest 5% and so does a higher wage share, though the last variable is insignificant. Government consumption also decreases the 5th percentile income while rising GDP per capita is inversely related to the income share of the richest 5% of the population implying that rising GDP per capita benefits the poorest members of the population.

Table 3: Regressions of BEI, EFF and DebtFI measures on 95th Percentile

	P95		P95		P95	
	Real sector		Financial Firms		Rest of World	
	(1)	(2)	(3)	(4)	(5)	(6)
L4_Household BEI	-.0214 (.013)	-	-	-	-	-
L4_Household BEI ²	.116 (.113)	-	-	-	-	-
L4_Household EFF	-	-.048*** (.0143)	-	-	-	-
L4_Household EFF ²	-	.178 (.0147)	-	-	-	-
L4_Government BEI	.0239*** (.0061)	-	-	-	-	-
L4_Government BEI ²	-.0144 (.0137)	-	-	-	-	-
L4_Government EFF	-	.0073 (.0052)	-	-	-	-
L4_Government EFF ²	-	-.0030 (.0145)	-	-	-	-
L4_Non-Financials BEI	.0033 (.0044)	-	-	-	-	-
L4_Non-Financials BEI ²	.0205 (.0127)	-	-	-	-	-
L4_Non-Financials EFF	-	-.0036*** (.0050)	-	-	-	-
L4_Non-Financials EFF ²	-	.0208 (.0136)	-	-	-	-
L4_Debt for Financial Investment	.0040 (.0086)	-.00057 (.0083)	-	-	-	-
L4_Debt for Financial Investment ²	-.0023 (.0043)	.00003 (.0041)	-	-	-	-
L4_Financials BEI	-	-	-.00057 (.0012)	-	-	-
L4_Financials BEI ²	-	-	.00277*** (.0007)	-	-	-
L4_Financials EFF	-	-	-	-.00063 (.0012)	-	-
L4_Financials EFF ²	-	-	-	.0028*** (.0007)	-	-
L4_Rest of World BEI	-	-	-	-	.0007 (.0011)	-
L4_Rest of World BEI ²	-	-	-	-	.0025*** (.0008)	-
L4_Rest of World EFF	-	-	-	-	-	.0013 (.0010)
L4_Rest of World EFF ²	-	-	-	-	-	.0024*** (.0008)
Gov. Consumption (% GDP)	-.0610*** (.0148)	-.0627*** (.0153)	-.0628*** (.0126)	-.062*** (.0126)	-.0627*** (.0132)	-.0623*** (.0132)

Inflation	-.0512 (.0527)	-.0059 (.0539)	-.050 (.053)	-.130 (0.083)	-.041 (.055)	-.042 (.0553)
Trade Openness	-.0008 (.0028)	-.0007 (.0029)	-.0034 (.0021)	.0034 (.0021)	-.0032 (.0021)	-.0033 (.0021)
Output Gap	.0426*** (.0084)	.044*** (.0083)	.036*** (.008)	.0363*** (.0080)	.037*** (.0079)	.037*** (.0079)
Log GDP per capita	-.0291*** (.0034)	-.030*** (.0034)	-.0307*** (.0033)	-.030*** (.0033)	-.030*** (.0032)	-.030*** (.0032)
Union Density	-.020*** (.0037)	-.0217*** (.0038)	-.018*** (.0036)	-.018*** (.0036)	-.0187*** (.0036)	-.0185*** (.0036)
Wage Share	-.0086 (.023)	.0013 (.0237)	.020 (.0020)	.020 (.0197)	.017 (.020)	.018 (.020)
Unemployment	-.054*** (.0176)	-.055*** (.0182)	-.035** (.0139)	-.0355*** (.0138)	-.032** (.0138)	-.032** (.0138)
Dummy 2001	-.0042 (.0029)	-.0046 (.0029)	-.0043 (.0029)	-.0043 (.0029)	-.0046 (.003)	-.0046 (.003)
Dummy 2002	-.0026 (.0024)	-.0032 (.0026)	-.0033 (.0024)	-.0033 (.0024)	-.0035 (.0025)	-.0035 (.0025)
Crisis Dummy	.0025 (.0016)	.0025 (.0016)	.0008 (.0015)	.0009 (.0015)	.0010 (.0015)	.0009 (.0015)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	22.33**	23.47***	27.76***	27.76***	26.31***	26.38***
Observations	721	721	721	721	721	721
Countries	13	13	13	13	13	13

Notes: Dependent variable is the 95th percentile's income share. Specifications (1), (3), (5) utilize indicator BEI while (2), (4), (6) utilize indicator EFF. Debt for Financial Investment is used only in (1) and (2)
*** $p < .01$, ** $p < .05$, * $p < .10$. Newey West standard errors are reported in parentheses.

The financial firms' borrowing in excess of real investment has a statistically significant effect on the 95th percentile income, though this effect is still marginal. The borrowing of the Rest of World to purchase domestic financial assets also supports the income of the top 5%. Similar effects are seen when using the EFF indicator. It is surprising that the richest 5% is not the one benefiting more from financial investments. The magnitude of the effect might be due to the panel not being long enough. It is plausible that the choice of 4 lags and 68 quarters is not sufficient to reveal the effects of the large magnitude of financial investments by financial firms and the rest of world on the income share of the 95th percentile.

Overall, the effect of financial flows on GINI, the 5th, and the 95th percentile is positive but of a small magnitude. The most striking finding is that excess borrowing and financial flows from financial firms and the rest of world seem to support the income of the poorest. Though the coefficient is small it is still positive. In order to further investigate and support the above findings, some robustness tests are run in Section VI.

VI. Robustness of the model

Asset Prices and Sectoral Borrowing

The first robustness check is to confirm whether excess borrowing and excess financial flows by households, non-financial and financial firms along with rest of world residents are indeed related to real housing prices⁴ and stock prices⁵, thus supporting the view that these indicators are directed into acquiring financial and real estate assets. Both households and non-financials are assumed to be able to purchase real estate assets. Table 4 shows the results of regressing the proxies BEI and EFF on the indexes of real house prices and share prices, controlling for inflation, government consumption the output gap, unemployment, the financial crisis and the dot-com bubble.

Housing prices are seen to be positively affected only by household BEI and EFF but not by non-financial firms. This is expected as activity in housing markets are mainly driven by demand for residential housing and not so much by commercial dwellings anymore. When it comes to the link between the financialization indicators and the OECD's share price index, weak evidence was found that excess financial flows and borrowing in excess of investment, of each sector are directed into acquiring shares and thus push up share prices. Only the indicators for financial firms and the rest of world (not shown) have the expected marginal effect. The DebtFI indicator is statistically significant but the marginal effect has the opposite sign of what it was expected. If debt is raised in order to perform stock buybacks, for example, then the marginal effect of the indicator should be positive. This unexpected result might be due inadequate observations as only data for 13 countries are utilized. Furthermore, the OECD Share price index might not be the best proxy for the actual share performance of individual stock indices of each country.

⁴ Index obtained by BIS database

⁵ Share Price index of the OECD

Table 4: Regressions of BEI, EFF and DebtFI measures on Asset Prices

	House Prices		Share Prices		Share Prices	
	Real sector		Real Sector		Financial Firms	
	(1)	(2)	(3)	(4)	(5)	(6)
L4_Household BEI	68.28*** (21.60)	-	-62.17 (38.26)	-	-	-
L4_Household BEI ²	570.15*** (182.59)	-	-50.61 (257.64)	-	-	-
L4_Household EFF	-	73.67*** (13.66)	-	66.11* (36.86)	-	-
L4_Household EFF ²	-	510.28*** (152.77)	-	-349.9** (165.62)	-	-
L4_Non-Financials BEI	5.79 (5.39)	-	11.94 (13.77)	-	-	-
L4_Non-Financials BEI ²	1.25 (5.75)	-	0.242 (13.43)	-	-	-
L4_Non-Financials EFF	-	-.161 (5.54)	-	3.14 (15.59)	-	-
L4_Non-Financials EFF ²	-	6.97 (5.06)	-	0.724 (13.44)	-	-
L4_Debt for Financial Investment	-7.53 (4.68)	-7.18 (4.50)	-91.92*** (21.80)	-103.6*** (23.80)	-	-
L4_Debt for Financial Investment ²	2.57 (1.88)	2.90 (1.83)	42.34*** (9.21)	47.14*** (10.24)	-	-
L4_Financial Firms BEI	-	-	-	-	-4.42 (3.92)	-
L4_Financial Firms BEI ²	-	-	-	-	12.8*** (3.09)	-
L4_Financial Firms EFF	-	-	-	-	-	-4.50 (3.93)
L4_Financial Firms EFF ²	-	-	-	-	-	13.06*** (3.07)
Gov. Consumption (% GDP)	-18.3*** (11.84)	-17.72 (11.97)	-10.42 (18.08)	-8.85 (17.99)	-9.78 (17.00)	-9.21 (17.09)
Inflation	104.77 (67.07)	13.02 (62.45)	720.43 (183.58)	639*** (176.55)	742.9*** (208.6)	741*** (207.8)
Output Gap	-22.98** (10.81)	-29.*** (10.31)	-9.89 (17.95)	-25.73 (16.47)	-20.19 (17.26)	-19.50 (17.25)

Unemployment	-184*** (13.05)	-165*** (13.23)	-326.4*** (39.01)	-295.1*** (40.64)	-284*** (34.60)	-283*** (34.45)
Dummy 2001	-26*** (3.68)	-25.*** (3.15)	-13.62** (6.96)	-13.60* (7.00)	-6.46 (7.02)	-6.44 (7.02)
Dummy 2002	-19*** (3.74)	-19*** (3.58)	-33.48*** (5.16)	-33.56*** (5.19)	-29*** (5.38)	-29.6*** (5.37)
Crisis Dummy	4.24** (1.98)	3.22* (1.82)	9.91 (7.29)	9.31 (7.33)	3.05 (7.37)	3.05 (7.38)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	34.57***	40.40***	15.84***	13.15***	15.84***	16.48***
Observations	681	681	817	817	817	817
Countries	13	13	13	13	13	13

Notes: Dependent variables are House Prices and Share Prices. Specifications (1), (3), (5) utilize indicator BEI while (2), (4), (6) utilize indicator EFF. Debt for Financial Investment is used only in (1) and (2)

**** $p < .01$, ** $p < .05$, * $p < .10$. Newey West standard errors are reported in parentheses.*

Overall, the above results show that there is some relation between the financialization indicators and the proxies for asset prices, but that relation is not always what it is expected. As stated before, the chosen asset price indicators might not be completely suitable for this analysis or the panel observations are not long enough for the expected relation to appear. Maybe a different specification that utilized country-specific indicators for both stock and house prices would indeed prove more convincingly that sectoral BEI and EFFs are directed into acquiring financial and real estate assets.

Table 5: Regression of EFF on Residential Investment

	Residential Investment
Household EFF	.189*** (.0264)
Control Variables	Yes
Time-fixed effects	Yes
F-statistic	23.03***
Observations	797
Countries	12

When Household EFF is regressed on a measure of residential investment in Table 5, controlling for time and business cycle effects, Household EFF is a statistically and economically significant predictor. This supports the hypothesis that financial flows unrelated to household net sectoral position flow into real estate assets and support residential investment.

Table 6: Regressions of BEI, EFF and DebtFI measures on market GINI

	Market GINI Real sector		Market GINI Financial Firms		Market GINI Rest of World	
	(1)	(2)	(3)	(4)	(5)	(6)
L4_Household BEI	-.0268*** (.0094)	-	-	-	-	-
L4_Household BEI ²	.0614 (.0638)	-	-	-	-	-
L4_Household EFF	-	-.0417*** (.0125)	-	-	-	-
L4_Household EFF ²	-	.0715 (.0667)	-	-	-	-
L4_Non-Financials BEI	-.0067* (.0035)	-	-	-	-	-
L4_Non-Financials BEI ²	-.0050 (.0087)	-	-	-	-	-
L4_Non-Financials EFF	-	-.0065* (.0037)	-	-	-	-
L4_Non-Financials EFF ²	-	-.0127 (.0080)	-	-	-	-
L4_Debt for Financial Investment	.0432*** (.0093)	-.0386*** (.0094)	-	-	-	-
L4_Debt for Financial Investment ²	-.0184*** (.0038)	-.0163*** (.0038)	-	-	-	-
L4_Financial Firms BEI	-	-	-.0007 (.0014)	-	-	-
L4_Financial Firms BEI ²	-	-	.0013* (.0007)	-	-	-
L4_Financial Firms EFF	-	-	-	-.0005 (.0014)	-	-
L4_Financial Firms EFF ²	-	-	-	.0012* (.0007)	-	-
L4_Rest of World BEI	-	-	-	-	-.0010 (.0011)	-
L4_Rest of World BEI ²	-	-	-	-	.00106* (.0006)	-
L4_Rest of World EFF	-	-	-	-	-	-.0010 (.0011)
L4_Rest of World EFF ²	-	-	-	-	-	.0011 (.0006)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	73.38***	76.72***	85.62***	84.17***	78.83***	78.41***

R ²	.4817	.4884	.4601	.4602	.4585	.4587
Observations	721	721	721	721	721	721
Countries	13	13	13	13	13	13

Notes: Dependent variable is the Market GINI. Specifications (1), (3), (5) utilize indicator BEI while (2), (4), (6) utilize indicator EFF. Debt for Financial Investment is used only in (1) and (2)
**** p<.01, ** p<.05, * p<.10. Driscoll-Kraay standard errors are reported in parentheses.*

Driscoll-Kraay estimation

To double-check the results obtained by the Newey-West estimator, the specifications are re-estimated using the Driscoll-Kraay Fixed Effects model. This estimator is robust to both heteroskedasticity and autocorrelated structures. Moreover, it is robust to general forms of spatial dependence. This estimator is chosen especially due to its last feature, considering spillover effects between EU countries are very plausible and are not taken into account by most panel estimators. The results are presented in Table 6 using the full amount of controls and the market GINI as the dependent variable.

Only household BEI and EFF have a jointly significant effect on the market GINI but this time BEI increases the GINI and while EFF decreases it. The only other effect that is jointly significant is the DebtFI indicator and the EFF indicator for non-financial firms. They both have the same sign as in Table 2 with debt for financial investments increasing income inequality while excess financial flows slightly decrease it. The effects of financialization indicators for the rest of the sectors become statistically insignificant.

With results not being exactly as expected, the specifications are re-estimated by dropping Ireland from the dataset as its financial flows are outliers in the data and they might affect the estimates. The results (not shown) do not change in a significant way. The inconsistent estimates might be due to cross-sectional dependence being taken into account with the Driscoll-Kraay estimator or it could be due to possible endogeneity of the independent variables. The next part examines the possibility that the financialization indicators are endogenous.

Endogeneity test

In order to address the issue of endogeneity, the Davidson-MacKinnon test is run for every specification of the model. While many panel analyses choose to run the dynamic panel Arellano Bond estimator, such a model is not suitable for this paper's dataset as $T > N$. The null hypothesis of the Davidson-MacKinnon test is that an ordinary OLS-FE estimator would yield similar consistent results as an IV-fixed effects estimator. The test is run after performing an IV regression for each specification. The null can be rejected for each specification at above the 10% level. Thus, the 1-year lagged financialization indicators can be considered exogenous (see appendix for technical details).

Reverse-Causality

The last robustness check performed regards the possibility of reverse causality. In this case, it is changes in the distribution of income that drives sectoral financial flows and borrowing. This is theoretically very plausible. Stockhammer (2013) explores how changes in income distribution have led to increased household indebtedness, asset bubbles and the rising propensity to consume by the more-well off, all of which are driven by financial flows unrelated to real sector transactions.

To test the above hypothesis the Granger non-causality test is employed. Since a balanced panel is required, the lagged versions of the financialization indicator cannot be used as they contain missing observations. Moreover, two countries, Denmark and Ireland, need to be dropped as they also contain missing observations. With only 11 countries, one needs to be cautious in generalizing the conclusions of the Granger test. Causality is tested for both directions, from financialization to income inequality and vice-versa. Only the variable market GINI is used to proxy income inequality.

When testing the hypotheses of this paper, namely that borrowing exceeding investment and excess financial flows of each sector affect the GINI, the Granger test rejects the null of no causality from financialization to income inequality only for household borrowing in excess of capital formation. In all other cases, causality is found to run from income inequality to financialization (see Appendix for technical details).

VII. Discussion and Limitations

This paper explores the link between financialization and income inequality. This research differs from the literature on the topic as it utilizes financialization indicators formulated theoretically from the theory of the Monetary Circuit and constructed via sector balances data from Eurostat's Quarterly Sector Accounts. The main hypothesis is that financial flows and borrowing unrelated to real sector transactions must flow into acquiring existing financial and real estate assets. As returns in the FIRE (Finance, Insurance, and Real Estate) sector are relatively quick and large, the accumulation of dividends, capital gains and interest payments result in a shift from real sector investment towards financial investment by all sectors of the economy. This comes at the cost of real economic performance and in turn, leads to structural shifts in income distribution.

The benchmark model finds marginal evidence for the link between financialization and income inequality. The model was estimated with the pre-tax market GINI to estimate the impacts of financial flows on the "raw" measure of income inequality. The Borrowing exceeding Investment measure of the government sector only affected the GINI index. Non-financial firms affect income inequality only via the debt for financial investment indicator by increasing the GINI index whereas financial firms and the rest of world always (via both BEI and EFF) put upward pressure on income inequality, though the effect is marginal. When these specifications are re-estimated with the Driscoll-Kraay estimator the household sector BEI and EFF indicators have a negative sign while the effects of financial firms and the rest of world sector turn insignificant. Only the debt for financial investment indicator remains significant and increases the GINI index.

Moreover, the financialization indicators are also regressed on the income shares of the bottom and top 5% of the populations. This is done to examine how financialization impacts the "extremes" of the income ladder. As discussed before, if one of these income groups are affected more than the other, we could "deduce" that the financialization indicators affect income distribution positively or negatively. It is found that household borrowing exceeding capital formation and excess financial flows put downward pressure on the income of the poorest 5 %, while household EFF increases the income share of the richest 5 %. Government excess financial flows support the income of the

5th percentile. These flows only become significantly large during the downturns, suggesting that borrowing to fund fiscal or financial support packages put a floor on aggregate income and employment. The most striking result was that financial firms and the rest of world flows support both the bottom and the top 5% income shares. It was expected that financial flows from these sectors support income creation for those who hold financial assets, or for the FIRE sector in general. The consequences of such actions would be the slowing down of productivity and economic activity in the real economy.

The nature of these results suggests that the financialization income inequality nexus is not strongly supported by the data of this paper. One explanation for this conclusion is that such a relationship could hold in the very long run, rendering the number of observations of the current dataset inadequate to reveal such a relation. Cointegration analysis might be a better method to investigate the long run financialization income inequality link. It can also be the case that the effects of these indicators vary with the level of asset prices or the size of the FIRE sector, suggesting that a specification where the financialization indicators are interacted with an index of asset prices, or the value added of the FIRE sector, might be warranted. Moreover, the theoretical channels of this nexus support more of a relation running from excess financial flows, and borrowing exceeding investment, towards wealth inequality first and then towards income inequality as in Figure 1. Capital gains, dividends and interest payments generated via investment in financial and real estate assets generate increase wealth and might affect the structural income distribution of an economy in the long run via an expanding “debt shift” towards the FIRE sector. Unfortunately, reliable data on wealth inequality for such an analysis are not available to the author’s knowledge.

Lastly, it can be the case that causality runs from income inequality towards increasing excess financial flows and debt accumulation for financial investment. This is supported by the Granger non-causality tests that are run in the robustness checks section. This causality has been theoretically investigated by Stockhammer (2013), for example, and can explain the weak support found for the causal link running from financialization to income inequality. If income distribution shifts towards the more well-off, due to tax policy or weakening of labor institutions, households try to maintain their standards of living via debt accumulation. Due to their lower marginal propensity to consume, the

more well-off accumulate large amounts of savings in the form of financial instruments leading to higher activity in asset markets. Thus, income inequality can indeed be the predecessor of large financial flows that are unrelated to non-financial transactions. It is more likely then, that the link between financialization and income inequality is not a one-way relation but rather a much more complicated and closed system resembling Figure 1.

Conclusion

This paper adds to the literature on the topic of the financialization income inequality measure. Most authors utilize credit measures, stock market capitalization or the value added of the FIRE sector as indicators of financialization. Empirical research provides mixed evidence on the relation between the two phenomena. The novelty of this paper is the sector balances based financialization indicators. These are inspired by the theory of the monetary circuit and by Spano (mimeo). The three indicators measure the magnitude of the incurred net liabilities in comparison to each sector's gross capital formation, the amount of borrowing (lending) in relation to sectoral net positions and the amount of debt raised by non-financial firms to fund financial investment.

Supportive but marginal evidence is found that these indicators increase income inequality measured by the market GINI index. The impacts of the sectoral financial flows on the bottom and top 5% income shares are also studied. It is found, for example, that government 'excess' financial flows and borrowing support the income share of the bottom 5%. The most striking finding was that financial flows from financial firms and the rest of world support both income shares.

The mixed findings invite more work to be done using this type of data to measure financialization. Data availability might be the biggest obstacle as the relation between financialization and income inequality is very likely to hold in the long run. A long run relation renders cointegration analysis a more suitable method of study. Moreover, it is more plausible that the causal chain does not immediately run from financialization to income inequality. As Figure 1 shows, there are several other variables that

intermediate, wealth inequality being one of them. The theoretical channels indeed predict that effects of financial flows might be larger on wealth inequality, thus the mixed findings of this paper are justified. As more data become available on the distribution of wealth, such an analysis will become more feasible.

Despite the mixed results, policy implications can still be discussed. If further research indeed finds that sectoral financial flows increase wealth and income inequality and work at the expense of the real economy, a financial transactions tax along with tax hikes on capital gains and dividends could reduce such flows. Moreover, it might also be effective to address the “debt shift” towards the FIRE sector via window guidance. Lavoie (2015, pg. 256) also agrees that “monetary authorities ought to bring back credit controls” but cautions “there is a danger (...) of evasion through disintermediation, moving financial activity from the regulated banking system towards the deregulated financial sector”. Tackling the issue of the unregulated shadow banking system is thus of utmost importance. If indeed the closed system of Figure 1 begins with income inequality, it is paramount to boost real wage growth above productivity growth as to increase the wage share of national income. Finally, a more progressive tax system can redistribute income from the highest percentile towards the lower income classes that have a higher propensity to consume, indirectly giving a boost to GDP growth.

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Appendix

Sample countries
<i>Belgium, Denmark, Germany, Finland, France, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, United Kingdom</i>

Table 1: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
BEI Financials	869	.269	.562	-1.93	3.26
BEI Government	869	.0084	.851	-.406	.712
BEI Rest of World	869	.201	.469	-2.73	3.43
Debt for Financial Inv.	936	.886	.373	-1.36	3.14
BEI Households	869	-.0245	.0465	-.242	.267
BEI Non-Financials	869	-.0238	.143	-.745	1.56
EFF Financials	869	.260	.561	-1.96	3.27
EFF Government	869	.005	.073	-.45	.66
EFF Households	869	.0257	.051	-.28	.3
EFF Non-Financials	869	.065	.147	-.48	1.72
EFF Rest of World	869	.171	.466	-2.73	3.43
Market GINI	936	.49	.024	.434	.553
Inflation	936	.0044	.0071	-.0303	.0355
Output Gap	936	.020	.092	-.207	.489
5th Percentile	936	.011	.003	.003	.0183
95th Percentile	936	.145	.0171	.109	.203
Union Density	836	.363	.221	0	.816
Wage Share	936	.547	.0430	.352	.617
Log GDP per Capita	933	8.86	.356	7.09	10.2
Gov. Consumption	936	.310	.0895	.068	1.81
Trade Openness	936	.869	.403	.429	2.33
Share Prices	936	115	44.2	31.6	335.9
Real House Prices	748	94.6	16.8	51.7	153
Residential Investment	864	.054	.022	.006	.139
Unemployment	936	.088	.044	.031	.277

Note: GDP per capita is measured in thousands of euros

Table 2: Description of Variables and their Sources

Variable	Description	Data Source
BEI Financials	Borrowing Exceeding Investment for Financials was constructed using the Net Incurrence of Liabilities of Financial Firms minus Acquisitions Less Disposals of non-producible non-financial assets	Eurostat Quarterly Sector Accounts & Author's calculations
BEI Government	Borrowing Exceeding Investment for the Government was constructed using the Net Incurrence of Liabilities of the General Government minus Gross Capital Formation minus Acquisitions Less Disposals of non-producible non-financial assets	Eurostat Quarterly Sector Accounts & Author's calculations
BEI Rest of World	Borrowing Exceeding Investment for the Rest of World was constructed using the Net Incurrence of Liabilities of the sector minus Acquisitions Less Disposals of non-producible non-financial assets	Eurostat Quarterly Sector Accounts & Author's calculations
Debt for Financial Investment	The indicator was calculated by using quarterly figures of business debt from all sectors in terms of GDP minus the Gross Capital Formation of each sector for that quarter	BIS & Author's Calculations
BEI Households	Borrowing Exceeding Investment for Households was constructed using the Net Incurrence of Liabilities of the sector minus Gross Capital Formation minus Acquisitions Less Disposals of non-producible non-financial assets	Eurostat Quarterly Sector Accounts & Author's calculations
BEI Non-Financials	Borrowing Exceeding Investment for Non-Financial Firms was constructed using the Net Incurrence of Liabilities of the sector minus Gross Capital Formation minus Acquisitions Less	Eurostat Quarterly Sector Accounts &

	Disposals of non-producible non-financial assets	Author's calculations
EFF Financials	Excess Financial Flows of Financial Firms was constructed using Net acquisition of Financial Assets (Net Incurrence of Liabilities) of the sector minus (plus) Net Lending of the sector	Eurostat Quarterly Sector Accounts & Author's calculations
EFF Government	Excess Financial Flows of the Government was constructed using Net acquisition of Financial Assets (Net Incurrence of Liabilities) of the sector minus (plus) Net Lending of the sector	Eurostat Quarterly Sector Accounts & Author's calculations
EFF Households	Excess Financial Flows of Households was constructed using Net acquisition of Financial Assets (Net Incurrence of Liabilities) of the sector minus (plus) Net Lending of the sector	Eurostat Quarterly Sector Accounts & Author's calculations
EFF Non-Financials	Excess Financial Flows of Non-Financial Firms was constructed using Net acquisition of Financial Assets (Net Incurrence of Liabilities) of the sector minus (plus) Net Lending of the sector	Eurostat Quarterly Sector Accounts & Author's calculations
EFF Rest of World	Excess Financial Flows of the Rest of World was constructed using Net acquisition of Financial Assets (Net Incurrence of Liabilities) of the sector minus (plus) Net Lending of the sector	Eurostat Quarterly Sector Accounts & Author's calculations

Market GINI	The market GINI index is calculated by using pre-tax market income.	Standardized World Income Inequality Database & Author's Calculations
Inflation	Inflation, average consumer prices (quarterly % growth)	Eurostat
Output Gap	Gap between actual and potential GDP at current prices (% of potential GDP)	Eurostat & OECD and Author's calculations
5th Percentile	The Income share of the poorest 5% of the population	UN World Income Inequality Database & Author's Calculations
95th Percentile	The Income share of the richest 5% of the population	UN World Income Inequality Database & Author's Calculations
Union Density	Trade union density measures as the ratio of employees that are members of a trade union over the total number of employees	OECD & Author's calculations
Wage Share	Total Wage Income as a % of GDP at current prices	AMECO & Author's calculations
Log GDP per Capita	The logarithm of GDP per Capita in current prices	Eurostat

Gov. Consumption	General Government Consumption as % of GDP	World Bank World Development Indicators & Author's Calculations
Trade Openness	Exports plus Imports as % of GDP	Eurostat & Author's Calculations
Share Prices	Quarterly Share Price Index	OECD
Real House Prices	Quarterly House Price Index (deflated by CPI)	BIS
Residential Investment	Investment in construction of dwellings as % of GDP	Eurostat
Unemployment	Unemployed as % of labor force	Eurostat

Table 3a: Correlation Matrix

	beifc	beigg	beirow	beihh	debtfi	beinfc	effc
beifc	1.0000						
beigg	-0.073*	1.0000					
beirow	0.7835*	-0.0436	1.0000				
beihh	0.2235*	-0.141*	0.1358*	1.0000			
debtfi	-0.0296	0.0793*	0.1125*	0.0498	1.0000		
beinfc	0.1954*	-0.105*	0.2948*	0.1920*	0.1041*	1.0000	
effc	0.9986*	-0.071*	0.7825*	0.2264*	-0.0322	0.1949*	1.0000
effgg	-0.0068	0.8565*	0.0070	0.0063	-0.0105	-0.0484	-0.0062
effhh	0.2823*	-0.134*	0.1563*	0.8425*	-0.131*	0.2179*	0.2834*
effnfc	0.1977*	-0.104*	0.3362*	0.2162*	0.2135*	0.9341*	0.1960*

Table 3b: Correlation Matrix

effrow	0.7924*	-0.0321	0.9955*	0.1411*	0.1067*	0.2990*	0.7906*
loggdpperc	0.1355*	-0.119*	0.1718*	0.0354	0.2946*	-0.0070	0.1318*
inflation	0.1664*	0.0998*	0.1005*	0.1560*	-0.159*	0.0614	0.1658*
outputgapnew	0.1938*	-0.174*	0.0545	0.4440*	-0.104*	0.1676*	0.1857*
Trade	0.1281*	-0.0250	0.3545*	-0.0224	0.5416*	0.1362*	0.1277*
realhouse	0.3267*	-0.0176	0.1910*	0.1352*	0.0202	0.0323	0.3306*
SharePrices	0.2996*	-0.126*	0.3435*	-0.0112	-0.0294	0.1906*	0.2970*
gengovgdp	-0.0628	-0.124*	-0.074*	0.0523	0.0067	-0.071*	-0.0641
unionden	-0.155*	-0.226*	-0.0703	0.1236*	0.1059*	-0.0084	-0.164*
wageshare	-0.0407	0.0908*	-0.168*	0.0263	-0.092*	-0.112*	-0.0282
ginimktint	-0.0284	0.3065*	-0.0048	-0.115*	0.2027*	-0.0337	-0.0296
p5int	0.1851*	-0.199*	0.1469*	0.1293*	0.1416*	0.0176	0.1844*
p95int	0.0867*	0.1942*	0.0303	-0.0266	-0.188*	0.1054*	0.0872*
unempquart	-0.309*	0.2492*	-0.194*	-0.340*	0.1137*	-0.129*	-0.308*
ResidInv	0.4145*	-0.0633	0.2578*	0.1074*	-0.343*	0.1474*	0.4186*

*Note: *** $p < .01$, ** $p < .05$, * $p < .10$*

Table 3c: Correlation Matrix

	p5int	p95int	unempquart	ResidInv
p5int	1.0000			
p95int	-0.4549*	1.0000		
unempquart	-0.4463*	0.1840*	1.0000	
ResidInv	0.0356	0.0788*	-0.2129*	1.0000

*Note: *** $p < .01$, ** $p < .05$, * $p < .10$*

Table 3d: Correlation Matrix

	effgg	effhh	effnfc	effrow	loggdpperc	inflation	outputgap new
effgg	1.0000						
effhh	-0.0006	1.0000					
effnfc	-0.0593	0.2212*	1.0000				
effrow	0.0119	0.1631*	0.3325*	1.0000			
loggdpperc	-0.0677*	-0.0253	0.0651	0.1496*	1.0000		
inflation	0.0804*	0.2317*	0.0596	0.1064*	0.0593	1.0000	
outputgapnew	-0.0615	0.4424*	0.1562*	0.0606	.2228*	0.1276*	1.0000
Trade	-0.0674*	-0.0969*	0.2377*	0.3322*	0.4130*	-0.0210	-0.1341*
realhouse	0.0248	0.2865*	0.0607	0.1986*	0.2546*	0.1038*	0.0944*
SharePrices	-0.0564	0.1220*	0.1920*	0.3379*	0.1016*	0.1512*	0.0884*
gengovgdp	-0.0671*	0.0312	-0.0672*	-0.0858*	-0.3332*	-0.0103	-0.0526
unionden	-0.1403*	0.0191	-0.0014	-0.0870*	0.3972*	-0.0309	0.1733*
wageshare	0.0651	0.1153*	-0.0910*	-0.1602*	-0.0314	0.0337	-0.0462
ginimktint	0.0982*	-0.2094*	-0.0349	-0.0916*	0.0165	-0.1560*	-0.0171
p5int	-0.0746*	0.1177*	0.0852*	0.1297*	0.4091*	-0.0078	0.0616
p95int	0.0896*	0.0192	0.0487	0.0588	-0.4770*	0.0511	0.0696*
unempquart	0.0809*	-0.4528*	-0.1511*	-0.1810*	-0.3895*	-0.1498*	-0.4850*
ResidInv	0.0454	0.3631*	0.1248*	0.2738*	-0.1730*	0.2362*	-0.0264

*Note: *** $p < .01$, ** $p < .05$, * $p < .10$*

Table 3e: Correlation Matrix

	Trade	realhouse	SharePrices	gengovgdp	unionden	wageshare	ginimktint
Trade	1.0000						
realhouse	0.1446*	1.0000					
SharePrices	0.2599*	0.5031*	1.0000				
gengovgdp	0.0525	-0.0883*	-0.0486	1.0000			
unionden	0.2181*	-0.0487	-0.0824*	0.3443*	1.0000		
wageshare	-0.170*	0.0975*	-0.3305*	-0.0615	-0.2817*	1.0000	
ginimktint	-0.0074	0.0069	-0.0106	-0.3435*	-0.437*	0.0209	1.0000
p5int	0.2757*	0.1241*	0.0376	0.2356*	0.3619*	0.1907*	-0.2547*
p95int	-0.285*	0.0799*	0.0862*	-0.2249*	-0.5206*	0.0724*	0.5788*
unempquart	-0.206*	-0.4343*	-0.2425*	-0.1417*	-0.2628*	-0.1441*	0.3105*
ResidInv	-0.084*	0.5950*	0.4233*	-0.0368	-0.2287*	0.0563	-0.2403*

*Note: *** p<.01, ** p<.05, * p<.10*

Table 4: Modified Wald Test for Heteroskedasticity

Model	chi2	Model	chi2
(1)	462.81***	(15)	6660.31***
(2)	432.26***	(16)	18764.09***
(3)	512.41***	(17)	4739.66***
(4)	511.00***	(18)	6731.20***
(5)	501.61***	(19)	8661.83***
(6)	501.99***	(20)	8294.40***
(7)	5399.70***	(21)	408.20***
(8)	2676.35***	(22)	417.23***
(9)	2996.23***	(23)	373.51***
(10)	4011.77***	(24)	372.16***
(11)	2620.54***	(25)	347.58***
(12)	2953.43***	(26)	349.55***
(13)	21551.16***	(27)	8121.29***
(14)	4645.53***		

*** p<.01, ** p<.05, * p<.10
H₀: sigma(i)^2 = sigma^2 for all i

Table 5: Wooldridge Test for Serial Correlation

Model	F	Model	F
(1)	5700.685***	(15)	4542.387***
(2)	6202.411***	(16)	4724.998***
(3)	5674.975***	(17)	4450.448***
(4)	5678.913***	(18)	4537.147***
(5)	5704.913***	(19)	334.643***
(6)	5735.320***	(20)	362.712***
(7)	2710.942***	(21)	908.290***
(8)	2979.434***	(22)	927.293***
(9)	2838.786***	(23)	953.575***
(10)	2631.133***	(24)	910.015***
(11)	2987.463***	(25)	832.731***
(12)	2848.202***	(26)	847.719***
(13)	4720.817***	(27)	32.566***
(14)	4464.273***		

*** $p < .01$, ** $p < .05$, * $p < .10$
H₀: no first order autocorrelation

Table 6: Structural Break Test

Model	F
(1)	10.19***
(2)	10.06***
(3)	13.38***
(4)	13.46***
(5)	13.74***
(6)	13.76***

*** $p < .01$, ** $p < .05$, * $p < .10$
H₀: no structural break

Table 7: Im Perasan Shin unit root tests

Variable	T-bar	T-tilde- bar	Z-t-tilde- bar
BEI Financials	-6.87***	-5.18***	-16.4***
BEI Government	-8.43***	-5.73***	-18.9***
BEI Rest of World	-7.31***	-5.30***	-16.9***
Debt for Financial Inv.	-1.79***	-1.70***	-0.94***
BEI Households	-8.09***	-5.51***	-17.8***
BEI Non-Financials	-7.64***	-5.38***	-17.3***
EFF Financials	-6.89***	-5.18***	-16.4***
EFF Government	-9.56***	-6.08***	-20.4***
EFF Households	-7.51***	-5.28***	-16.8***
EFF Non-Financials	-7.28***	-5.30***	-16.9***
EFF Rest of World	-7.35***	-5.33***	-17.1***
Market GINI	.728	.582	9.13
Inflation	-9.84***	-6.03***	-20.07***
Output Gap	-8.56***	-5.63***	-18.29***
5th Percentile	-.854	-.893	2.62
95th Percentile	-.466	.565	4.07
Union Density	-2.02**	-1.95**	-2.07**
Wage Share	-1.89**	-1.86**	-1.65***
Log GDP per Capita	.318	0.08	6.92
Gov. Consumption	.257	-.037	6.40
Trade Openness	-3.83***	-3.43***	-8.59***
Share Prices	-1.60	-1.59	-.446
Real House Prices	-1.51	-1.46	.066
Residential Investment	-1.47	-1.42	.257
Unemployment	-1.27	-1.19	1.28

*** $p < .01$, ** $p < .05$, * $p < .10$
H₀: All panels contain unit roots

Table 8: Davidson-MacKinnon endogeneity test

Model	F
(1)	1.7349*
(2)	2.23*
(3)	0.071
(4)	.118
(5)	.0422
(6)	.1047
*** $p < .01$, ** $p < .05$, * $p < .10$ H_0 : OLS-FE estimates consistent	

Table 9: Granger non-causality tests

Variable	Z-bar	Z-tilde-bar
GINI-BEIHH	2.54**	2.34**
BEIHH-GINI	13.66***	12.89***
GINI-EFFHH	1.85*	1.69*
EFFHH-GINI	24.91***	23.56***
GINI - BEINFC	1.19	1.06
BEINFC - GINI	8.56***	8.05***
GINI - EFFNFC	1.22	1.09
EFFNFC - GINI	9.24***	8.69***
GINI - BEIGG	1.07	0.95
BEIGG - GINI	9.35***	8.80***
GINI - EFFGG	0.60	0.50
EFFGG - GINI	0.67	0.57
GINI - BEIFC	1.14	1.08
BEIFC - GINI	8.55***	8.05***
GINI - EFFFC	1.39	1.25
EFFFC - GINI	8.68***	8.16***
GINI - BEIROW	1.60	1.45
BEIROW - GINI	6.24***	5.85***
GINI - EFFROW	1.40	1.26
EFFROW - GINI	5.42***	5.07***
*** $p < .01$, ** $p < .05$, * $p < .10$ H_0 : Variable B does not Granger cause variable A		