

# Inequality Fragility Hypothesis

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*The last four decades have been marked by growing inequality. The inequality of income and wealth is one of the most important macroeconomic issues of our time. Inequality contributed to Global Savings Glut and Global Financial Crisis through riskiness channel and a greater propensity to borrow for poor people. This paper presents evidence that besides structural factors, monetary policy, high leverage and the development of new money substitutes are critical in explaining the inequality trend in advanced countries. Increasing economic inequality acts as financial instability enhancer and if left untreated it poses a significant threat to economic sustainability.*

**Keywords:** inequality, wage share, wealth distribution, debt, financial instability

**JEL classification:** B22, D31, E50

## 1. Introduction

Although Piketty's Capital in the 21st Century in which he stated that capitalism is prone to inequality, became a commercial success, inequality is still a poor treated subject in literature and a challenge for policymakers. Several books, papers and articles have pointed out the relevance of income and wealth distribution in macroeconomics. Stiglitz (2013) provides a variety of issues caused by inequality. The price of inequality is slower GDP growth, a weakened democracy and a diminished sense of fairness. Rajan (2010) explains how inequality entailed political pressure to ease consumption through credit growth. Kumhof and Ranciere (2010) investigate how changes in income distribution can lead to high leverage and crises. Confronted with declining or stagnant incomes, workers will limit their drop in consumption with credit expansion. Large debt-to-income ratios generate financial fragility. They also find a mechanism to explain global current account imbalances by considering the counterpart of a capital account surplus to be an increase in current account deficit. Berg and Ostry (2011) explore the relationship between income inequality and sustained economic growth. Their research concludes that inequality is the most important factor associated with longer growth spells.

The paper differs from most studies on this topic in that it analyzes inequality from a monetary perspective and its main purpose is to raise awareness regarding distributional effects of monetary policy. This paper claims that rising inequality wasn't just the consequence of structural factors, it also had a monetary cause.

The rest of this paper is structured as follows: In section II I present the role of inequality in disequilibrium economics and a holistic approach of distributional effects, in the third section I present the

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main reasons why distribution is an important for economic stability and the resemblance between the Keynesian and a self proposed Kaleckian multiplier. In Section IV I investigate the the link between inflation, wages and unemployment. The following section focuses on recommendations and an analysis of distributional consequences of monetary policy.

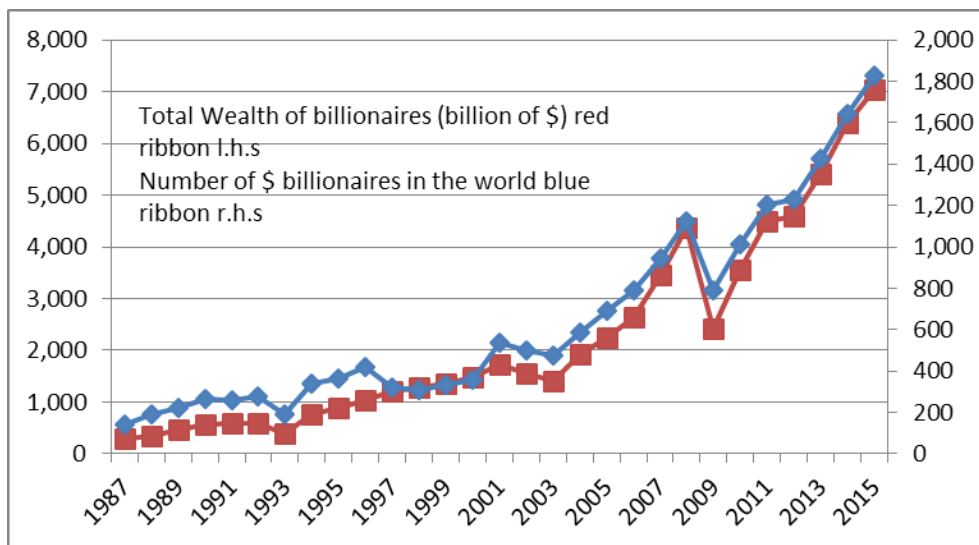
The data which was used for Granger causality test to show the substitution between human capital and financialisation was retrieved from Philippon (2014) Supporting Data. For detecting fat tails in loan impulse and testing that an increase in credit precedes an asset price boom I used Federal Board Reserve database and updated Stock market data from Shiller's book "Irrational Exuberance".

## 2. Inequality and Disequilibrium

In this paper I propose a new theory called "Inequality Fragility Hypothesis" as a new framework for crises involving four attributes:

1) *As wealth inequality is higher, the gap between aggregate supply and demand is growing.*

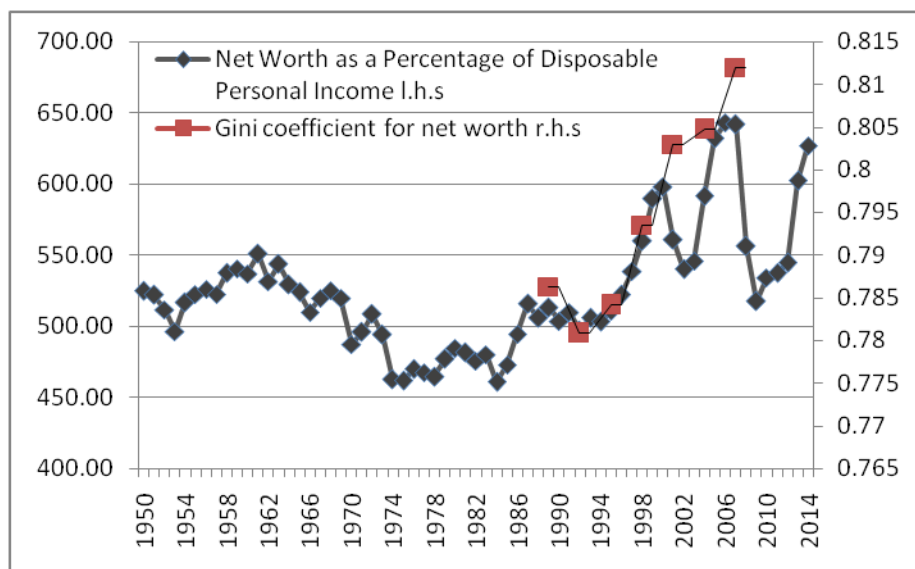
There are two types of transactions: GDP and non-GDP, money doesn't only serve as a mean of exchange, but is also used for wealth accumulation, resulting in an unproductive circuit (non-GDP transactions). Speculations lead to growing inequalities, which means more wealth and more opportunities to speculation for the wealthy. Even in an exchange economy, Say's Law cannot be valid, in case of high unequal wealth distribution, demand would collapse. Say's law is not restored on long-term because is possible to accumulate wealth in excess of the limits of practicable consumption. "Business men habitually aspire to accumulate wealth in excess of the limits of practicable consumption, and the wealth so accumulated is not intended to be converted by a final transaction of purchase into consumable goods or sensations of consumption" (Veblen, 1909). This event is evident because not only the number of billionaires has multiplied since 1987 (see figure 1), but also in 2014 the richest 80 people had amassed as much wealth as the bottom half of the world's population, down from 388 in 2010 (Oxfam, January 2015).



**Figure 1.** Evolution of World's billionaires

Source: <http://piketty.pse.ens.fr/en/capital21c2> and Forbes

When inequality grows the wealth-income ratio increases and so the top decile/percentile is flooded with excess capital over time. Less and less of all that money will be allocated to productive investment, instead it will be devoted to speculations or lent to speculative and Ponzi units, thus keeping the system away from equilibrium. In U.S. speculations contributed to wealth concentration, which in turn gave rich people more resources to make unproductive gains.



**Figure 2.** *U.S. Households and Nonprofit Organizations Net Worth as a Percentage of Disposable Personal Income and Gini Coefficient for net worth*

Sources: Net Worth as a Percentage of Disposable Personal Income from Board of Governors of the Federal Reserve System, Z.1 Financial Accounts of the United States, Series ID HNONWPDPI, Not Seasonally Adjusted, Frequency Annual, Aggregation Method Average, Units Percent, Gini Coefficient for net worth: Kennickell (2009)

This spiral has continued until crises took place (see figure 2). So money is employed in real production (GDP) and in capital gains (do not count in GDP). Fisher's equation of exchange proved to be false.

$$M * V = P * Q$$

M – money supply, V – velocity of money, P – prices, Q – quantity.

Aggregate supply is equal to aggregate demand, if money is used only for consumption purposes (money is used just for exchange, not for wealth accumulation).

Other disturbances, in dynamic equilibrium this time, appear to arise from changes in aggregate demand which produce disruptions in income (future expenditure plans count for determining aggregate demand). "If income is to grow, financial markets, where the various plans to invest and save are reconciled must generate an aggregate demand that, aside from brief intervals, is ever rising. For real aggregate demand to be increasing, given that commodity and factor prices do not fall readily in the absence of substantial excess supply, it is necessary that current spending plans be greater than current received income and that some market technique exist by which aggregate spending in excess of aggregate anticipated income can be financed. It follows that over a period during which economic growth takes place, at least some sectors finance a part of their spending by emitting debt or selling assets. For such planned deficits to succeed in raising income... it is necessary for some of the spending to be financed either by portfolio changes which draw money from idle balances into active circulation (that is, by an increase in velocity) or by creation of new money" (Minsky, p. 6, 1982). Equation (1) is the equation of growth if we ignore the leakages from and injections into the circular flow of income and idle balances (Palley, 2014).

Ex-post definition  $AD = Y + \text{Net Bank Credit Creation}$  ex-ante definition

where, AD - aggregate demand (goods and services), Y – nominal income, Net Bank Credit Creation – change in bank credit stock or new bank credit creation minus repayment of debt as only credit from commercial banks creates purchasing power, while in case of bonds, existing purchasing power is transferred between parties.

Therefore, temporarily, income is not equal to aggregate demand with a single exception (point X). X is the point where the change in credit creation is 0 and  $Y = Y_{(-n)}$ , before that point the flow of credit is negative implying  $Y < Y_{(-n)}$ , beyond point X,  $Y > Y_{(-n)}$ . Volatility in credit expansion takes place with a design to fuel speculative booms that aggravate wealth and income distribution, subject treated in section 6.

But, disequilibrium is at its best observed at the microeconomic level, where there can be overproduction or overconsumption.

$$\text{Production} - \text{Consumption} = \text{Change in Stocks} \quad (2)$$

$$\text{Supply}_{t1}(\text{Production}_{t1} + \text{Stocks}_{t0}) - \text{Demand}_{t1}(\text{or Consumption}_{t1}) = \text{Stocks}_{t1} \quad (3)$$

From equation (3) supply seems to be always greater than demand, however there may be also shortages (crops, oil, energy) meaning that demand is greater than its supply. This supply-demand gap can be

covered with fiscal deficits for a short time because on long-term it can lead to indebtedness. The other approach consists in inequality reduction. Relative income hypothesis developed by James Duesenberry states that the propensity to consume of an individual is a decreasing function of his percentile position in the income distribution. As a result, decreasing income inequality can stimulate demand and will avoid misalignments in production structure, as the poor can't afford the same lifestyle after a credit crunch.

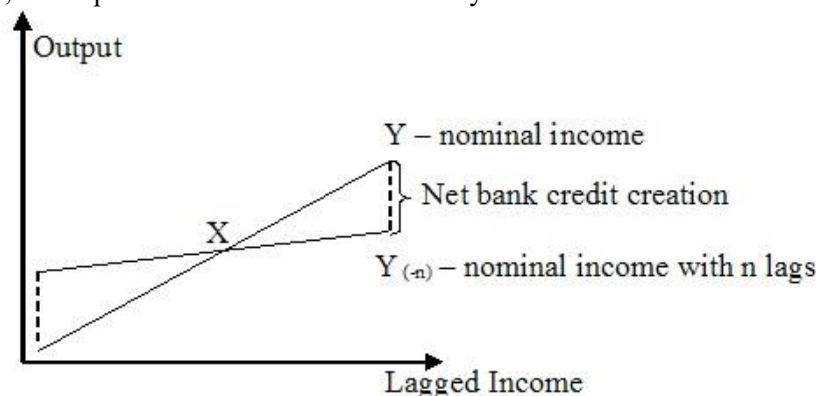


Figure 3. Aggregate demand and credit

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## 2) Income and wealth inequality amplify financial instability.

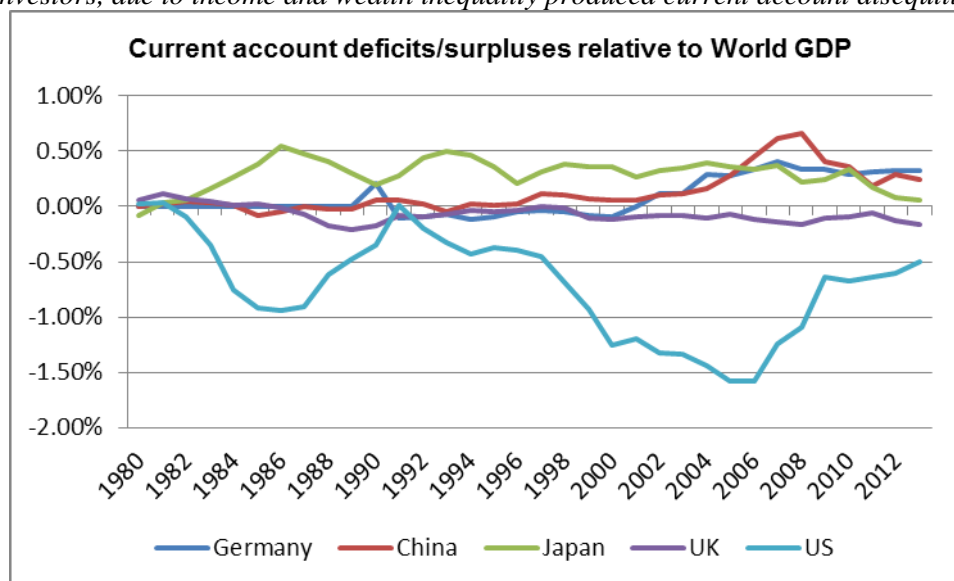
Inside deregulated markets, low income households borrow in order to adhere to the same living standards with wealthy individuals. Marginal tax rate cuts on high incomes, a relatively stagnant minimum wage and development of monopsonies have contributed to higher inequality. Public policies have enhanced rent extraction and rent opportunities, especially at the expense of others (Stiglitz, 2013). The most gifted in doing so are the top 0.01% if we take a look at a Taleb's analysis:

"The one percent of the one percent of the population is vastly more sensitive to inequality than total GDP growth (which explains why the superrich are doing well now, and should do better under globalization, and why it is a segment that doesn't correlate well with the economy). For the super-rich, one point of GINI causes an increase equivalent to 6-10% increase in total income (say, GDP). More generally, the partial expectation in the tail is vastly more sensitive to changes in scale of the distribution than in its centering." (Taleb 2013, p. 153)

In addition to financial sector deregulation, U.S government encouraged banks to help meet the credit needs of the communities in which they operate, mainly low income neighborhoods (NINJA loans, NINJA – No Income, No Job or Assets) through credit promotion policies (Community Reinvestment Act):

"The political response to rising inequality – whether carefully planned or an unpremeditated reaction to constituent demands – was to expand lending to households, especially low-income ones. The benefits – growing consumption and more jobs – were immediate, whereas paying the inevitable bill could be postponed into the future. Cynical as it may seem, easy credit has been used as a palliative throughout history by governments that are unable to address the deeper anxieties of the middle class directly. [...] In the United States, the expansion of home ownership – a key element of the American dream – to low and middle-income households was the defensible linchpin for the broader aims of expanding credit and consumption. But when easy money pushed by a deep-pocketed government comes into contact with the profit motive of a sophisticated, competitive, and amoral financial sector, a deep fault line develops." (Rajan 2010, p. 9) As expressed by Austrians (Huerta de Soto 2009, p. 409), the money creation process ensures a redistribution of income and wealth in favor of those who get the new injections of money over the rest of society who will pay higher prices. This did not work in U.S and other developed countries because of low inflation which didn't give them an advantage and as well because of the massive wave of speculations. This inequality and indebtedness trends weren't present just in U.S (see annex 6), it has been to the fore in most developed countries (see annexes 1 and 2).

- 3) *Inequality worsened current account imbalances. Increasing savings of foreign and domestic investors, due to income and wealth inequality produced current account disequilibrium.*



**Figure 4.** Current account disequilibrium

Source: data from UNCTADstat, author's calculations

US has become the “deficit of last resort” (Stiglitz, 2012). The reason, behind this phenomenon is the use of dollar as a global reserve currency, thereby, creating a counter-sense force that makes dollars leave United States and leads to a current account deficit (see figure 4). The current account disequilibrium was amplified by wealth and income concentration at the top end across the world. While some papers (Milanovic and Lakner, 2013) claim that global income inequality has fallen by using Global Gini Coefficients, in fact the Top 1 %/Average annual incomes per capita ratio has been climbing over the years (see table 1) and the global wage share followed a downward trend (see annex 3).

**Table 1.** Income inequality evolution

Average annual incomes per capita (in 2005 PPP-adjusted USD) Top 1%						1988-2008 change	1993-2008 change
Year	1988	1993	1998	2003	2008		
	38964	39601	46583	51641	64213	64.8%	62.1%
Average annual incomes per capita (in 2005 PPP-adjusted USD)							
	3295	3287	3471	3631	4097	24.3%	24.6%
Top 1 %/Average	11.82519	12.0477639	13.42063	14.22225	15.67317549	32.54%	16.78%

Source: (Milanovic and Lakner, 2013), author's calculations

Regarding global wealth inequality, there is another story (see annex 4). It may seem that global inequality decreased between 2001 and 2009, yet it could be only a distraction. In general, non-financial assets like housing, land and small business assets make up a relatively large proportion of household wealth in the developing world and in transition countries. In contrast, financial assets form a large proportion of the household balance sheets in developed countries. Within high level wealth groups, the bulk of wealth is represented by financial assets, while at lower wealth levels real assets tend to dominate. Given the real estate booms across the world before Global Financial Crisis, the fact that 49% of the ultra high net worth individuals are from U.S and 3.67% belong to UK while over 46.5% of millionaires are either American or British (Credit Suisse, Global Wealth Databook 2014) and probably similar ratios before crisis, is easy to understand the misleading data. The rising housing prices during boom closed the gap in composition of world gross wealth between financial and non-financial wealth and according to Atkinson (1989) rising house prices reduce the share of the top wealth percentile in the UK and Wolff (2009) reveals that the ratio of equity prices to house prices has a beneficial effect on the wealth share of the top percentile in U.S or as Yellen (2014) expressed „housing wealth is the most important source of wealth for all but those at the very top”, assumption that can be generalized. The 19.55% Compound annual growth rate of Total Wealth of Billionaires (2009-2015) and

the growing wealth share of top percentile occurred due to quantitative easing inflating bubbles on stock market and the poor losing their homes for being unable to pay back mortgage loans.

The consequence is clear: 2 simultaneous booms can hide an unequal accumulation of wealth. Practically, the Global Savings Glut (Bernanke, 2005) that was responsible for the large current account deficit of United States was possible because of global wealth and income inequality widening gap between individuals. Inequality developed current account surpluses in emerging markets and deficits in developed economies (especially in U.S) through what I call riskiness channel: high-income groups usually hold riskier financial assets (for evidence see Kennickell, 2009, Figure A3a). The riches from emerging markets with underdeveloped financial markets and other export-led countries invested their wealth in the major financial centers causing large volatilities in current accounts (mean absolute deviation of OECD countries' current account widened from 2.95% in 1995 to 6.76% in 2007, data from UNCTADstat, author's calculations). Their savings provided means for financing imports, the counterpart of a capital account surplus is an increase in current account deficit (Kumhof and Ranciere, 2010).

- 4) *Inequality is detrimental to human capital. Rising income inequality inhibit human capital formation (a key point in technology evolution) in poor countries, while in rich countries students must get over-indebted in order to pay university fees through student loans.*

Technology is the key factor in economic development of a nation and it is a function of investment (reinvested profit and credit used in production) and human capital. "Children whose parents are in the top quintile of the wealth distribution have a 36 percent chance of also being in the top quintile and a 60 percent chance of being in one of the two top quintiles in their adult years" (ISAACS, SAWHILL and HASKINS 2008, p.9) and 74% of students in the most selective colleges come from families in the top quartile (Carnevale and Rose 2003, p. 141). Only 29% of highscoring students from low socioeconomic backgrounds had completed a bachelor's degree or higher compared to 30% of low-scoring students with high socioeconomic status, 51% middlescoring students with high socioeconomic status and 74% high-scoring students from high socioeconomic backgrounds (Fox, Connolly and Snyder 2005, p. 51). Education is vital to economic mobility: adult children of parents in all five quintiles who achieve a college degree are much more likely to climb up the ladder seeing that 41% of adult children from the bottom quintile make it to the top two quintiles if they earn a college degree and only 14 percent of the adult children without a college degree from the bottom quintile of parental income reach the top two quintiles (ISAACS, SAWHILL and HASKINS 2008, p. 95). Access to education is clearly a factor of the Great Gatsby curve, term coined by Alan B. Krueger (2012) which involves that higher income inequality is associated with less mobility across the generations. Student loans have an uptrend in general and particularly low level income families (see Annex 5). Given the job polarization in U.S Autor (2010), a student loan crisis would be catastrophic for American economic system.

#### *Another framework for typical crises*

Business cycle theory has become a fairy tale. The current view is that GDP presents temporary deviations from its "natural rate" or its trend. The Great Recession proved otherwise, there were no small deviations, this time there was a L-shaped recovery. Credit instability is at the core of business cycles. The spiraling debt incurred in financing speculative investments leads to cash flow problems for investors, which are forced to sell their assets in order to pay their debt. This causes a sudden major collapse of asset values named Minsky Moment. We are all Minskyans now. For all that, his masterpiece (financial instability hypothesis) is incomplete without explaining the way economic inequality (economic inequality is a broader concept than income inequality, see Sen, 1997) amplifies financial instability and in what other manners influences economic cycle.

Inequality also depends on structural factors like urbanization and immigration (at national level immigration will have a negative effect on equality of income whilst on global level will have positively affect income distribution) due to increased labor supply. The annual fitted average growth rate of the share of urban population in total population in 1950 – 2010 In U.S is 0.33%, while on 1790 – 1940 is 1.8% (author's calculations, data from World Urbanization Prospects, 2014 Revision and Historical Statistics of the United States 1789 – 1945). Immigrants as Percentage of the U.S. Population reached its maximum in 1890, 14.8% (data from Migration Policy Institute 1850 – 2013). The highest amount of inequality was registered after the Great Recession top 10% Income Share excluding capital gains - 47.76% and including capital gains - 50.6% in 2012 (see The World Top Incomes Database), but immigration reached its top during 1870-1910. Also there was a decline in immigration for 2 decades before the Great Depression and inequality continued to grow. All these point the existence of other forces with high impact on distribution besides structural factors.



We can find clues in Leverage Cycles introduced by Geanakoplos. “Over the cycle inequality can dramatically increase if the leveraged buyers keep getting lucky and dramatically compress if the leveraged buyers lose out.” (Geanakoplos, 2010) The reverse is also possible. The distinction between leverage cycle and credit cycle is that the latter has a constant LTV (Geanakoplos & Fostel, 2013). Extreme wealth inequality can reduce margins and transform a credit cycle into a Leverage Cycle.

### 3. Why Inequality Matters

- Increased inequality may shorten growth duration, as one IMF study indicated that longer growth spells (the interval starting with a growth upbreak and finishing with a downbreak) are correlated with less income inequality (Berg and Ostry, 2011)
- Improving income equality will narrow the saving gap between income groups, thereby tightening conspicuous consumption by the rich and emulation by the less affluent.
- Nassim Nicholas Taleb reveals that “In Extremistan, inequalities are such that one single observation can disproportionately impact the aggregate, or the total” using an example related to net worth “Consider by comparison the net worth of the thousand people you lined up in the stadium. Add to them the wealthiest person to be found on the planet—say, Bill Gates, the founder of Microsoft. Assume his net worth to be close to \$80 billion—with the total capital of the others around a few million. How much of the total wealth would he represent? 99.9 percent?” (Taleb 2010, p. 61) The rising income and wealth inequality in the last decades has made our world closer to Extremistan than Mediocristan, making it prone to Black Swans.
- According to Piketty (2012) in the last decades the wealth is inherited
- A more egalitarian approach will improve the health and education of the poor; income redistribution is an investment in human capabilities
- Income inequality and entitlements are the causes behind famine in some parts of the world, not shortage of food, like the Bengal famine of 1943, the Ethiopian famine of 1973, or the Bangladesh famine of 1974. (see Sen, 1988)

In market economies there must be a degree of inequality in order to function, but what is the reason for such great inequalities? There is a competition between capitalists and workers (in fact there is a third type of participant, the managers who get paid with wage and shares, but for simplicity I will use only 2 classes: capitalists and workers). There seems to be a labor market conflict, thus during the economic boom the wage share in G7 countries has fallen, as shown in Annex 7 while during crunch, the share of wages in GDP increased, since profits and output have collapsed and profits are the last paid. A Kaleckian income distribution model is a useful tool for this purpose.

$Y = C + I$  where  $Y$  = national income;  $C$  = Consumption;  $I$  = Investment

$Y = S + P$  where  $S$  = Salaries;  $P$  = Profits

$C = C_p + C_s$ ,  $C_p$  = capitalists’ consumption,  $C_s$  = workers’ consumption

$C_p = \alpha * P$ ,  $\alpha$  - fraction of consumed profits

$C_s = S$ , Workers are presumed to consume all they earn.

$S + P = C + I$ , therefore  $S + P = S + \alpha * P + I$

$P = I + C_p$

Aggregate investments together with capitalist consumption determine aggregate profits and consequently also the savings that they require, and not the reverse. Also, Investment determines Savings through changes in Income via the multiplier principle developed by Richard Kahn, and via the newly created purchasing power (loans) for the investment to carry on, will eventually become someone’s savings.

$P * (1 - \alpha) = I$

$P = I / (1 - \alpha)$ ,  $Y = S + P$ ,  $Y = S + I / (1 - \alpha)$ ,  $s$  = employees’ income share in GDP,  $S = s * Y$

$Y * (1 - s) = I / (1 - \alpha)$

$Y = I / (1 - s)(1 - \alpha)$

The Kahn–Keynes multiplier will be greater as the marginal propensity to consume is higher. The marginal propensity to consume  $c$  can be approximated by the share of wages in national income and the Kahn–Keynes multiplier  $1 / (1 - c)$  can be replaced with the Kaleckian multiplier expressed as  $1 / (1 - \text{marginal distribution towards wages})$ . A greater distribution towards wages implies higher economic growth. While

these two models seem to resemble, in fact in the last decades in most developed countries, the consumption of workers was financed by loans not by income, hence the kaleckian model proves to be a sustainable alternative.

<b>Kaleckian multiplier</b> $\Delta Y = \Delta S + \Delta P$ ; $P = f(I)$ , $P = I + C_p$ , $\Delta P \approx \Delta I$ $\Delta Y = \Delta S + \Delta I$ $\Delta Y = g_s \cdot \Delta Y + \Delta I$ $G_s$ – distribution of growth to wages, $g_s = \Delta S / \Delta Y$ $\Delta Y \cdot (1 - g_s) = \Delta I$ $\Delta Y / \Delta I = 1 / (1 - g_s)$ which means $K \approx 1 / (1 - g_s)$	<b>Keynesian multiplier</b> $\Delta Y = \Delta C + \Delta I$ $\Delta Y / \Delta I = K$ , $K$ – multiplier $K = \Delta Y / (\Delta Y - \Delta C)$ $K = \Delta Y / (1 - \Delta C / \Delta Y)$ $K = 1 / (1 - c)$ , $c$ is MPC, marginal propensity to consume
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**Figure 5. Kaleckian and Keynesian multipliers**

Blinder (1974) indicates that income inequality variation is greater than MPC's variation. However, Blinder has conducted its research in a period (1947-1972) with low inequality and strong bank regulation. The elasticity of MPC to wage share (% of GDP) for the 1973-2007, period chosen for deregulation and great income inequality variance) is -1.979, whereas the elasticity of Compensation to employees/GDP is for the same period is -4.960. Both Keynes (2009) and Kalecki (Osiatynski 1990, p. 372) were wrong, redistributing income to the less affluent won't reduce propensity to save, at least this wasn't the trend in U.S. A more equal distribution of income will make the contact with higher consumption individuals decrease, resulting a reduced propensity to consumption (Duesenberry 1949, pp. 44-45).

A decline of Kahn multiplier will not follow because less money will be available to speculate and more money will be utilized for purchases of goods and services (wealth to income ratio will also decrease), income and consumption will gain a stronger pace on real terms, while the consumption-income ratio will drop (as the consequence of previous psychological explanation and a smaller wealth effect - an increase in wealth will cause an increase in consumption). I conducted a Granger causality test in order to analyze the relationship between wage share (% of Personal Income) and financialisation in U.S, characterized by the size of financial sector. I used Augmented Dickey-Fuller and Phillips-Perron tests to examine the series (the first difference of logarithms) for stationarity. In both cases and for both series, the test value is less than the critical value for any of the levels of relevance therefore, the null hypothesis is rejected. The data samples match a normal (Gaussian) distribution (Jarque-Bera test).

For autocorrelation of errors I conducted Correlogram of Residuals (Q-Statistics) for a Bivariate AR (one lag) OLS regression with DL\_WAGE\_SHARE as dependent variable and Breusch-Godfrey Serial Correlation LM Test for DL\_VA\_FIN as dependent variable. The performed tests indicate that errors are independent. The Correlogram Squared Residuals revealed that error terms don't present heteroskedasticity. The residuals are normally-distributed (Jarque-Bera test). The correlation between wage share and the value added by financial (raw data) is  $\approx -0.94$  and  $R^2 = 0.88$ .

$$Va\_fin_t = \alpha + \sum \beta_i (Va\_fin_{t-i}) + \sum \psi_j (s_{t-j}) + \varepsilon$$

$$s_t = \Phi + \sum \varphi_i (s_{t-i}) + \sum \omega_j (Va\_fin_{t-j}) + \varepsilon, i=1, n \ \& \ j=1, n$$

**Table 2. Granger Causality**

Pairwise Granger Causality Tests			
Date: 08/30/15 Time: 20:24			
Sample: 1947 2009			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
DL_WAGE_SHARE does not Granger Cause DL_VA_FIN	60	3.87182	0.0267
DL_VA_FIN does not Granger Cause DL_WAGE_SHARE		3.37679	0.0414

Source: wage share from BEA, author's calculations, VA\_FIN from Philippon (2014)

The p – values are under 0.05 (selected significance level) meaning the relationship is mutual and the past values of wage share predict the current level of value added by the financial sector and viceversa. In export-led countries like Germany the Private Consumption/GDP decreased because the middle class with



declining incomes didn't get indebted as the reference group represented by top-end households raised their saving rate indirectly through corporate net saving and thanks to bank lending practices in Germany which are more conservative than in US (Treec, Treec and Sturn, 2012). The same goes for China, the share of consumption in GDP depressed (Treec and Sturn, 2012). It seems that rising inequality in debt-led countries leads to declining savings and viceversa for export-led countries.

States are open economies and countries where foreign trade is an important part of the economy, can be profit-led. But, the global economy is a closed economy since exports and imports cancel each other, therefore the global GDP is wage-led (high trade openness of economies leads to greater competition, it should not be a competition between states, but between companies). Mercantilism affects not only the economy that provides global reserve currency, but also global aggregate demand: when reserve accumulation is the result of current account surpluses, there is a reduction in global aggregate demand as highlighted by UN Commission of Experts on Reforms of the International Monetary and Financial System. That's why Keynes Plan involved a system that taxed surplus countries. Plus it is not possible for the majority of the export-seeking countries to grow out of a pro-capital redistribution of income, when this strategy is applied in many other large economies at the same time.

Here we can also add the well-known fact that during and post-recession, current accounts are more balanced because enterprises reduce their production costs and consumers (except the richest, but they do not make up the majority) don't afford anymore high value added products made abroad as result of falling incomes and low credit availability. The concepts „wage-led” and „profit-led” were introduced by Bhaduri and Marglin (1990) and their model measures the impact of 1 per cent point increase in the profit increase over private aggregate demand (private consumption, investment and net exports). The results of researches (Onaran and Galanis, 2012) using this model are paradoxical inasmuch as the private consumption/disposable income ratio in U.S. has grown, despite the upward trend of income inequality. Even more, there can't be permanently wage-led or profit-led economies, as maximum growth would be reached when the wage or the profit share is zero. Clearly, this is a false statement. Logically an economy goes through stages of wage-led and profit-led growth. We can find evidence in this case following the events after The Great Depression. The crisis led to a redistribution policy in favor of wages after World War II, this period was named the Golden Age. This system has exhausted its synergy three decades latter ending in the Great Stagflation. The crisis was a reason for income redistribution in favor of profits that has taken place since and caused the current crisis.

As both regimes have failed, I can conclude that the assumptions made above are correct and because in average growth was more robust over the Golden Age than during the Great Moderation (and due to generally negative net exports), without any calculations we can say that U.S. is wage-led upon long-term. Seeing that two totally different systems had taken place one after the other resulting in different crisis we can draw another set of conclusions:

- the stronger each class becomes, the greater is its capacity to further increase its share of income until a crisis or a political change occurs
- there is no optimum wage share or profit share, because of the never ending war between classes, the distribution of income is unstable and pursuing wage-led growth will make the economic growth less sensitive to wage share growth. Likewise pursuing profit-led growth on long term will undermine GDP growth.

Nevertheless, the long distribution waves are mostly in favor of capitalists. The introduction of managers in this story shows us that top incomes earners today are CEOs or new entrepreneurs, not “rentiers” (Saez, 2013) doubling the pressure for low-income earners. In the same time, bailouts with lack of regulations and punishment (leaders are rewarded for their incompetence) threaten recovery and set the foundations of future crisis and the next long distribution wave in favor of the rich.

#### **4. The Link between Inflation, Wages and Unemployment**

The conventional belief is that unemployment is a consequence of high wages, an outcome of downward wage rigidity. This is wrong. Wages don't exhibit rigidity in either direction, they are changed only at fairly long stretch (Leijonhufvud, 2012) and if wages were flexible it would make things much worse during a debt-deflation (Leijonhufvud, 2002) as the fall of wages would exacerbate deflation and real debt, or during a stagflation where rapid increase in wages would amplify inflation. Even in normal times, extreme volatile wages would be detrimental for not providing stability to employees and for reducing the ability of enterprises to adapt to new circumstances.

The classical view that rising unemployment is the result of high wages was reinforced in the 1970s, when the wage share hit record high in developed countries. However, in the subsequent decades,

unemployment was on average higher (compared to unemployment recorded during Golden Age of Capitalism) whilst real wages were far behind productivity growth. Wages should not be viewed as an impediment for investment, but as a source of stable demand. Wages would be detrimental to economic growth just in a profit squeeze situation, conjuncture that seems far away from our days. Wage increase could make the transition to a moderate rate of inflation. A moderate inflation can avoid liquidity trap entrance. Minsky argues that if the rate of inflation is high at the time of the crisis, even though the bust causes investment to slump, rising cash flows enable the repayment of debt incurred before the economic collapse. The result is slow growth and high inflation, but few bankruptcies. This is a self-correcting mechanism because prolonged slump is avoided (Keen, 1995).

A moderate inflation may improve economic performance: it can melt away the debt and reduce unemployment (the latter is a consequence of the first one and of the money illusion which holds true at low and moderate inflation). Inflation is influenced by wages and money among other factors. The relationship between inflation and money supply growth is weak when the inflation is low (Stiglitz). Improving income inequality by rising wages could help the transition to moderate inflation and it can be further improved after the completion of this phase without creating inflationary pressures. For reducing income inequality and not giving rise to further inflationary pressures it is required a policy that would encourage faster wage growth for poorly paid jobs relative to growth of wages for highly paid work. This means that at the bottom, wage growth will exceed productivity growth, while at the top, productivity growth will surpass wage growth (Minsky, 1968), in this way repairing the inequalities made during Great Moderation.

## 5. Fiscal and International Solutions

The following fiscal and international solutions are note-worthy:

- Progressive taxes ameliorate income inequality and reduce the expansion of budget deficit in case of public wage growth
- Increase fiscal pressure and improve redistribution. Post taxes Gini Index (gini\_net) is on average lower than Gini before taxes (gini\_market) see Solt, 2009. The most important public expenses is education, it will reduce frictional unemployment and it will lessen social immobility. Job matching and public services are crucial, not welfare spending.
- Another idea is the inheritance tax. It is implemented in few states, but in emerging states it could chase away investors
- A better collection of taxes by eliminating loopholes in tax law
- More bargaining power for workers and increase minimum wages. The last measure would also reduce tax evasion since many employers conclude work contracts to the minimum wages (gray tax evasion area).
- Liberalize migration so that poor people can move to richer countries

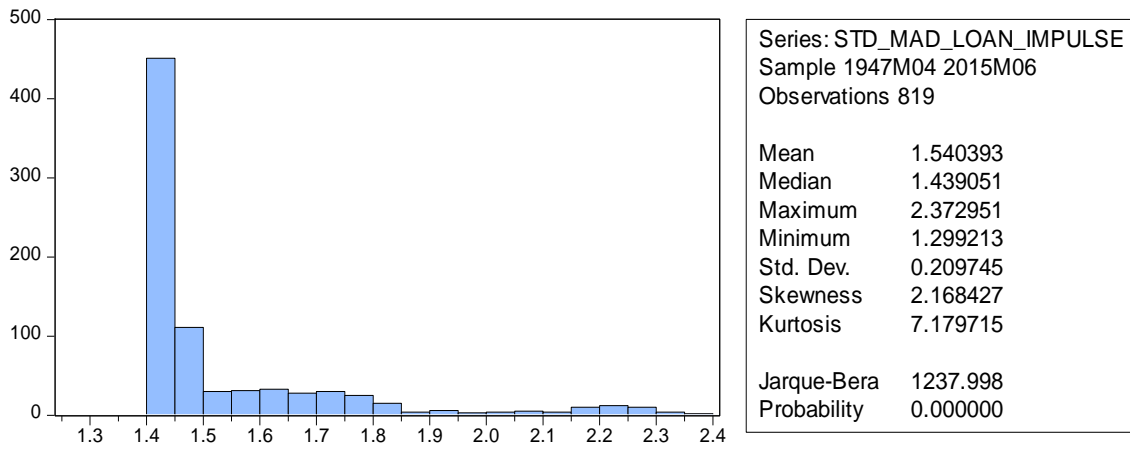
## 6. Monetary Solutions

Some of the fiscal solutions have obvious drawbacks and must be doubled by monetary policies who likewise influence wealth and income distribution.

Nassim Nicholas Taleb and Daniel G. Goldstein (2007) showed that the ratio of standard deviation and mean absolute deviation is about 1.25 if the series of variables is Gaussian and greatly increases in a world of fat tails. As we can see in figure 7, the loan impulse in U.S. between 1947M01-2015M03 is highly unstable. The leptokurtotic distribution obtained with an excess kurtosis  $> 7$ , exhibit volatility clustering, meaning that “large changes tend to be followed by large changes – of either sign” (Mandelbrot, 1963).

The inexistence of neutrality in the long term entails distributional effects of monetary policy. We must underline that Austrians reject the idea of long-run neutrality of money since credit expansion will always distort the structure of production (Huerta de Soto, 2009, pp. 540-541). The essence of Inequality Fragility Hypothesis is the spiral between financial markets and economic inequality. Finance can quickly degenerate into a rent-seeking activity thanks to the flexibility provided by financial engineering (Zingales, 2015).

Between 1960 and 2009 the financial industry doubled its share in GDP. Besides rent-seeking, there is another reason for this increase in financial industry: GDP grew slower because of more and more money being oriented to asset markets instead of being allocated to business, while financial industry had to grow to support the creation of securities. Aggregate demand (GDP) is formed of basic aggregate demand and the demand generated solely by speculative bubbles (Croitoru, 2015). But, even the bubble before Great Recession could not produce any excess in aggregate demand (Summers, 2013). Inequality has contributed via riskiness channel.



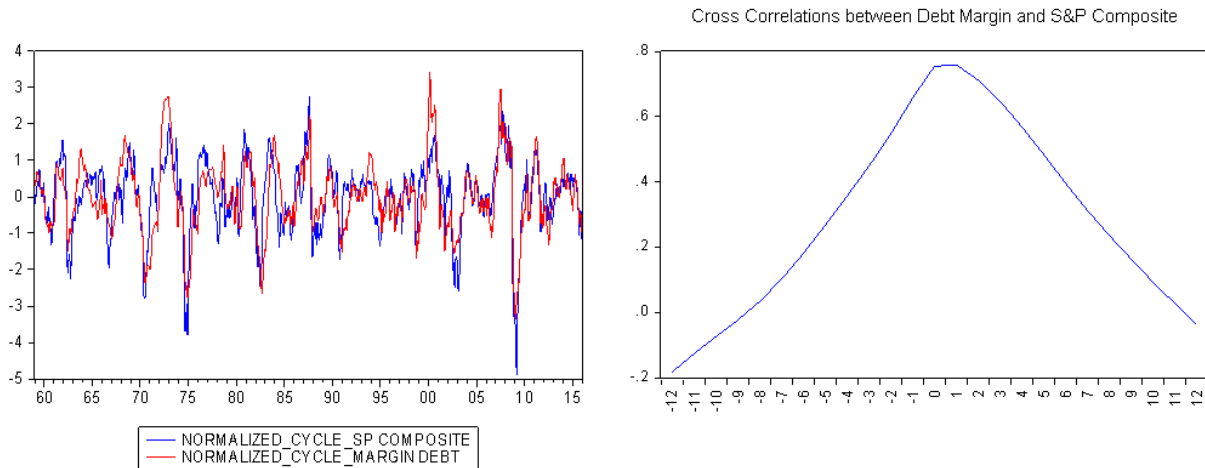
**Figure 6. Credit Instability**

Source: Federal Reserve Board, H8, Loans and leases in bank credit, all commercial banks, Monthly data, not seasonally adjusted

Since 1997Q3 M2 velocity has recorded an almost permanent drop signaling the development of an overtrading economy. If money supply grows faster than nominal GDP, the consequences will be the development of speculative bubbles and decreasing velocity. The upward drift in credit demand came from inequality and the advance in supply of credit was driven by financial innovation (securitization) “in many cases the expansion of credit resulted from the development of substitutes for what previously had been the traditional monies” as asserted by Charles Kindleberger (2005, p. 64). We can test the hypothesis of credit-driven asset prices by using S&P Composite as proxy for financial asset prices. Its dependence on Debt Margin can be plotted with HP filter.

$Y_t = G_t + K_t$ ,  $Y_t$  is the analyzed variable, in this case, debt margin and SP Composite,  $G_t$  – growth component (trend) and  $K_t$  – cyclical component

$\sum_{t=1}^T K_t^2 + \lambda \sum_{t=1}^T [(G_t - G_{t-1}) - (G_{t-1} - G_{t-2})]^2$  – the minimizing equation to smooth trend,  $\lambda = 14400$



**Figure 7. Credit and financial asset prices**

Source: Margin Debt, Monthly data, New York Stock Exchange, 1951M01 – 2016M01, S&P Comp. P data from Shiller, Robert J., Stock Market Data Used in "Irrational Exuberance" Princeton University Press, 2000, 2005, 2015, updated, Monthly Data

The normalized debt margin log deviations from HP trend are correlated with normalized asset prices log deviations and the mutual causality is obvious it as the correlation with one lag (asset pricing depending on debt margin) is 0.6572 while the correlation with one lead is 0.7589.

Residence property prices are too dependent on debt (see annex 8) in most developed countries except for Germany.

Monetary policy has two main channels that influence economic inequality in contrary sense: the riskiness channel, an expansionary monetary policy will put upward pressure upon equity prices, therefore raising the wealth of the rich and credit channel which benefits the first to get the new injections of money (the

poor have higher debt ratios relative to income and wealth), only if inflation is high enough to gain advantage over others and to meltdown their debt without affecting purchasing power (real incomes are rising).

$$C_{lih} = a * Y_{lih} + b * W_{lih}$$

$C_{hih} = \rho * a * Y_{hih} + \rho * b * W_{hih}$ ,  $C_{lih}$  – consumption of low-income households,  $C_{hih}$  – consumption of high – income households,  $0 < a < 1$ ,  $0 < b < 1$ ,  $0 < \rho < 1$ ,  $a < b$

$$W = W_{lih} + W_{hih}, W - \text{household wealth}$$

$R_a = \theta * W_{lih} + \rho * \theta * W_{hih}$ ,  $R_a$  – riskless assets (money, T-bills, real assets without mortgage). When inequality rises,  $R_a / W$  will drop and credit to money and loans to money ratios will grow. Because money is not neutral, the influence of money and near-monies on distribution can modeled as:

$I = I_0 + MI$ ,  $I_0$  – inequality independent of monetary evolutions,  $MI$  – monetary inequality represented by capital gains, their distribution and

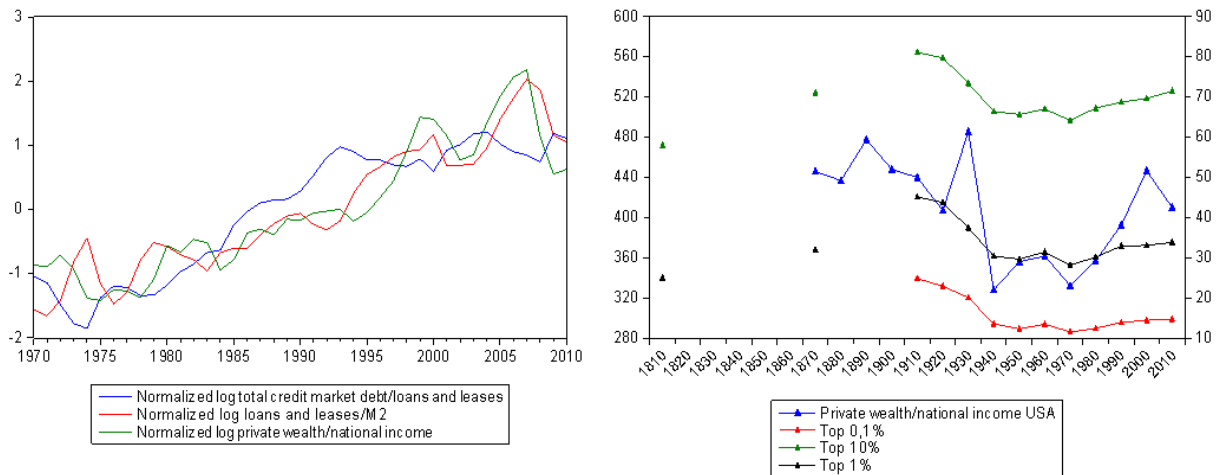
$W_t / Y_t = [W_{t-1} * (1 - \text{Depreciation}) + \text{Investment}] * (1 + e_t) / Y_{t-1} * g$ ,  $e_t$  – **existing assets price inflation in excess over GDP deflator**,  $g$  - real growth, (modified version of Piketty's two-good model wealth accumulation model)

$$Y = Y_{ww} + Y_{we}, Y_{ww} - \text{aggregate demand without wealth effect}, Y_{we} - \text{wealth effect}$$

$$Y_{we} = b * (W_{lih} + \rho * W_{hih}), W_{lih} - \text{low income households}, W_{hih} - \text{high income households}$$

$$W_{lih} / W_{hih} = X$$

$Y_{we} = X + Y_{EA}$ ,  $Y_{EA}$  – demand for existing assets, wealth effect is dependent on demand for existing assets and on the distribution of wealth.



**Figure 8. Relationship between wealth and credit**

Source: Piketty, T., Technical appendix of the book « Capital in the 21st century

The Circular relationship between development of non-bank credit, decoupling loans from money, wealth and wealth inequality is obvious in the previous figure.

Inflating asset prices with excessive credit is a wealth inequality driver. Afterwards wealth supplies collateral for more borrowing. Generally, low income households own more riskless asset such as money and real asset, but they use their homes mostly not as a source of income or speculation, but as residence. Inflation doesn't erode the wealth of the poor because their propensity to save is reduced. It is possible that asset price downturns are the natural way of the economic system of correcting distribution by whipping fortunes achieved through monetary gains without added value, given that during recessions inflation falls less than the relative price of assets, acting as automatic stabilizers against inequality. Debt becomes the income of financial sector. After the Great Recession, the household debt to GDP ratio has shrunk in size, yet financial income and the share of top 10% income share continued their upward trend. These are the results of quantitative easing. Policymakers are trying to cheat the business cycle, but it won't work. The weak economic grow is a by-product of asset gambling and resource misallocation of an overly large financial sector. In general, is believed that credit impulse influences only investment, the stock of credit equals stock of capital (Biggs, Mayer and Pick, 2009). Investment is a flow and is linked to the flow of credit therefore the change in investment and thus, economic growth is dependent on credit impulse.

$$\Delta I = \Delta \Delta Cr, \Delta I - \text{change in investment}, \Delta \Delta Cr - \text{credit impulse}$$

Textbooks describe financial intermediation like this: households save and companies invest their savings. It is wrong. Commercial banks create money (other financial intermediaries perform a transfer of purchasing power) and in the last decades household debt went through the roof. Capital is divided into

productive capital and financial capital (existing assets trading). Credit impulse is also related to financial capital. Curbing credit impulse and preserving credit flow at sustainable levels plus targeting a moderate and stable inflation will smooth asset price bubbles and inequality. With these policies it will be less probably that borrowing will be based on the collateral value rather than on expected cash flows.

The actions needed to mitigate credit impulse: use a form of capital requirements (Equity/Total Assets) for all financial institutions to counter credit impulse fluctuations (prohibit securitization because it allows avoidance of capital requirements and decouples credit from money or at least include off balance sheet items in formula and impose restrictions on preferred shares as financial corporations can raise capital without slowing credit creation), impose loan to value ratios and debt thresholds for all borrowers (homeowners, margin buyers and businesses) during boom. This proposal should not be confused with the Basel III regulatory framework. It doesn't involve risk-weighted assets. All Basel Agreements have been procyclical. Another error of Basel regulation structure is that stress testing implies that macroeconomic shocks affect financial institutions. In reality is quite the opposite: the inverted yield curve affects the profitability of financial intermediaries. The future reduction in credit supply will have a negative impact on real activity (see Adrian, Estrella and Shin, 2010).

A greater distribution towards high income households led to a smaller wealth effect in comparison to the period before crisis. This under potential growth has sparked controversy among theorists. The two mechanisms provided by Keynes, 2009 (interest rates) and Kalecki (income distribution) for equilibrating Savings and Investments, can provide an explanation. It is possible that decreasing wage share over long periods of time would contribute among other factors to higher ex-ante savings than ex-ante planned investment because capitalists and corporate sector save more. Corporations are sitting on piles of cash and have become net holders of financial assets, exerting more stress on real interest rates to fall in order to reach equilibrium, which combined with low inflation favored search for yield and build-up of large debt. Anyway, regardless of accepted theory, secular stagnation, global savings glut, debt supercycle or Gordon's headwinds, they all have one common element: increasing inequality.

## 7. Conclusions

The paper analyzes the main outcomes and determinants of income and wealth inequality at global level and especially in U.S. The vicious circles between economic inequality and financial instability are highlighted by increasing debt-to-income ratios for low income households that borrow in order to adhere to the same living standards with wealthy individuals and by riskiness channel: high-income groups usually hold riskier financial assets. The Global Savings Glut and current account volatilities were the result of increasing inequality. The riches from countries with weak financial markets and export oriented nations invested a great percentage of their wealth in U.S. transforming it in the deficit of last resort. Rising inequality in debt-led countries leads to declining savings and viceversa for export-led countries. Social immobility is yet another negative consequence of high income inequality because access to education is restricted for students from low income families.

One of the main determinants of income and wealth distribution in U.S is financialisation because of asset gambling and resource misallocation. My analysis reveals that human capital is substituted with financialisation in an overtrading economy. Asset prices depend on credit as credit log deviations from HP trend are correlated with normalized asset prices log deviations and precede it and if the leveraged buyers are lucky inequality will rise. Because of non-neutrality of money, inequality can be classified into inequality independent of monetary evolutions and monetary inequality. Central bankers can ameliorate monetary inequality by targeting moderate inflation and curbing credit impulse. This study can be further developed by comparing the actual income and wealth inequality with the results produced by a life cycle model, the difference being identified as monetary inequality and simulating the impact of monetary policy on it.

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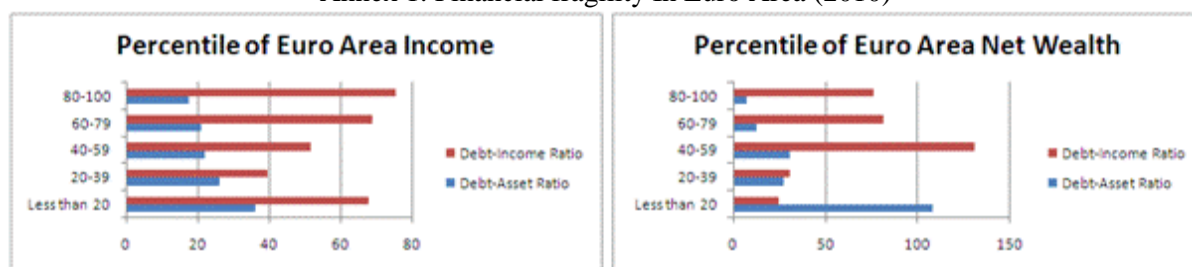
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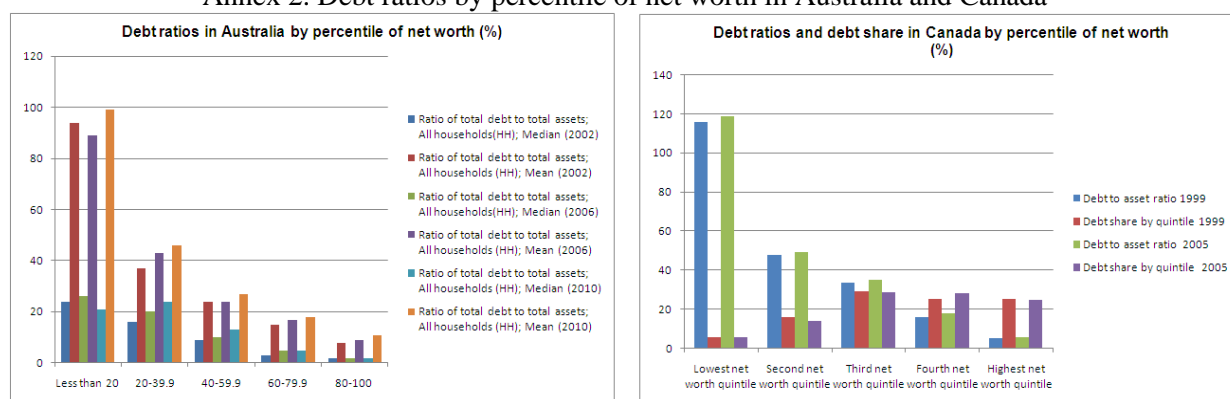
## Appendices

### Annex 1. Financial fragility In Euro Area (2010)



Source: Statistics Paper Series NO 2 / April 2013 The Eurosystem Household Finance and Consumption Survey Results from the first wave, pp. 65, Year of reference 2010 (Belgium (2010), Germany (2010), Greece (2009), Spain (2008), France (2010), Italy (2010), Cyprus (2010), Luxembourg (2010), Malta (2010), Netherlands (2009), Austria (2010), Portugal (2010), Slovenia (2010), Slovakia (2010), Finland (2009))

### Annex 2. Debt ratios by percentile of net worth in Australia and Canada



Source: Australia RBA, Publication date 15-mar-2012 and Canada Survey of Financial Security Statistics Canada (2005), author's calculations

### Annex 3. Share of labour income in world gross output



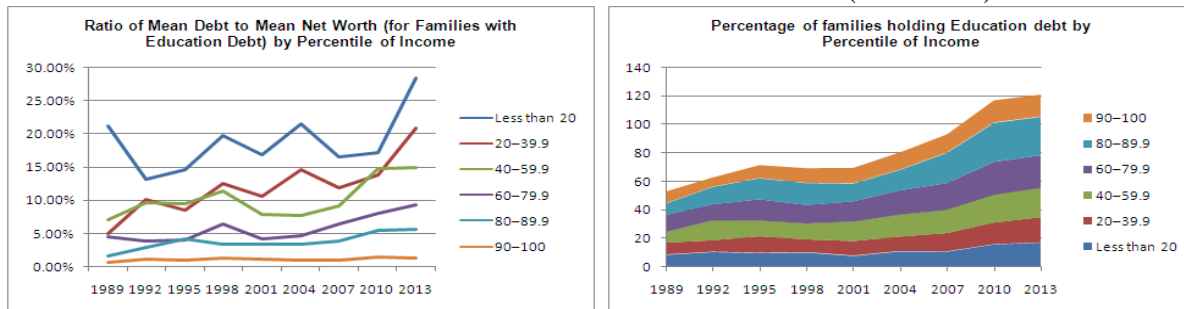
Source: POST-2015 POLICY BRIEF, No.02, 29 NOVEMBER 2013, GROWTH AND POVERTY ERADICATION: WHY ADDRESSING INEQUALITY MATTERS

### Annex 4. Wealth share of top percentile in the world, 2000-15 (%)

2200 1	2200 2	2200 3	2200 4	2200 5	2200 6	2200 7	2200 8	2200 9	2201 0	2201 1	2201 2	2201 3	2201 4	2201 5
448. 4	446. 9	446. 3	446. 3	446. 9	446. 1	444. 7	444. 2	444. 0	444. 4	445. 0	446. 0	447. 1	448. 2	550. 0

Source: Global Wealth Databook 2014, 2015, Credit Suisse

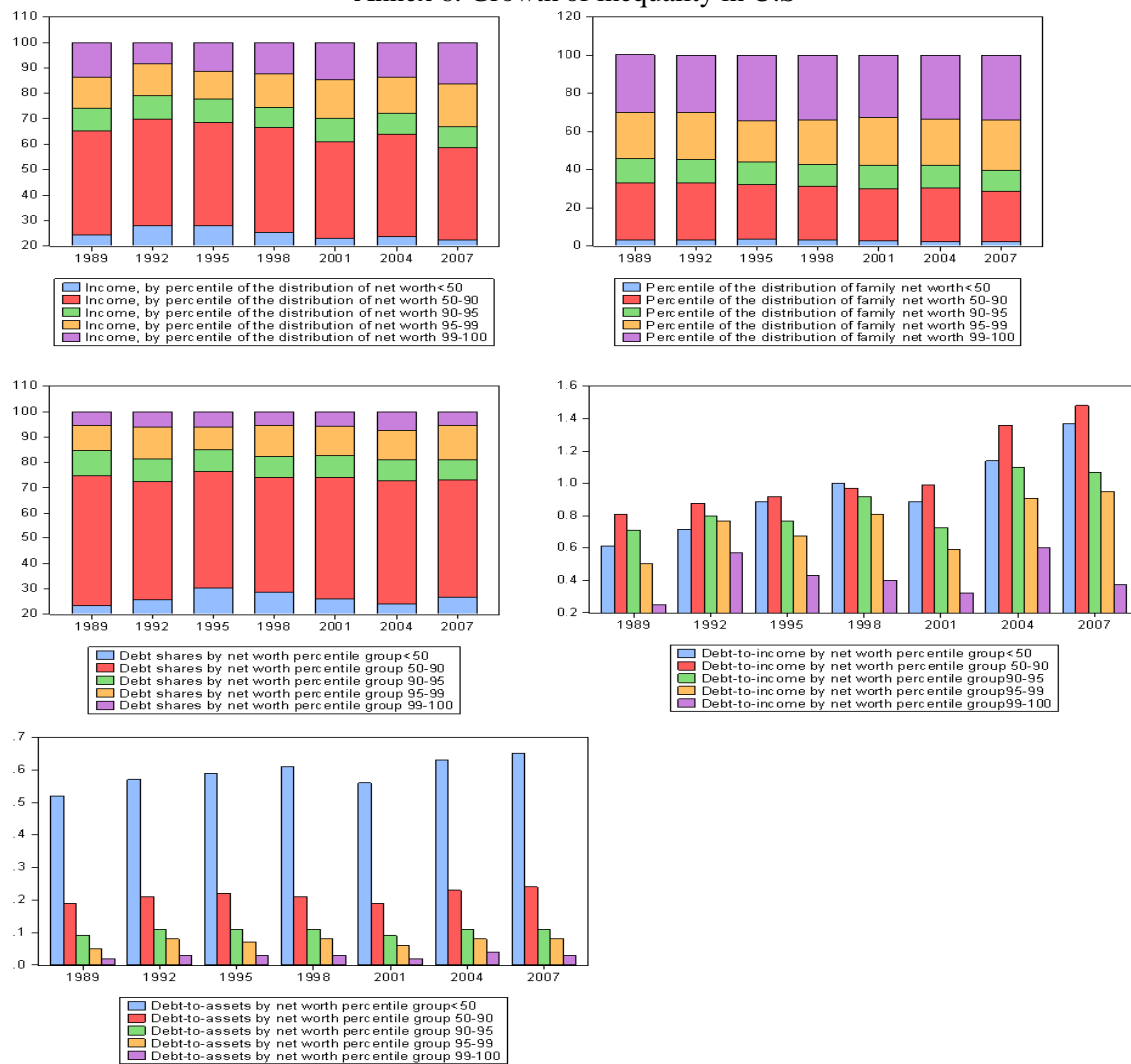
### Annex 5. Evolution of Education Loans in U.S (1989-2013)



Source:

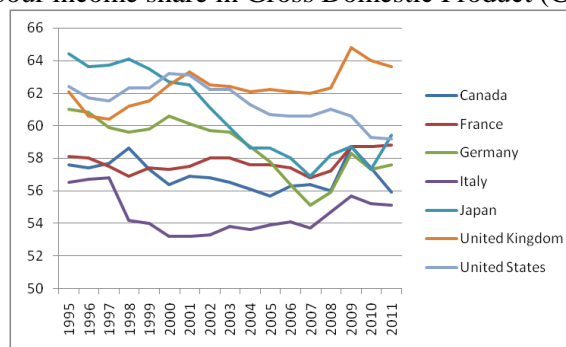
Survey of Consumer Finances 2013, author's calculations

### Annex 6. Growth of inequality in U.S



Source: Kennickell (2009), author's calculations

## Annex 7. Labour income share in Gross Domestic Product (GDP) - adjusted



Source: Global Wage Report Collection from ILOSTAT

## Annex 8. Residential property prices and Household debt/GDI



Sources: National sources, BIS Residential Property Price database (<http://www.bis.org/statistics/pp.htm>), OECD Financial statistics