Rise of Household Debt and the Great Recession in the US: Comparative Perspectives

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Abstract

The Great Recession has provided an important intellectual challenge to both post-Keynesian and mainstream economists. In this article, we survey the influential post-Keynesian views on the rise of household debt in the US, as well as the Atif Mian and Amir Sufi's studies, perhaps the most influential and empirically oriented studies of mainstream economics. We highlight some of the commonalities and differences between them. By examining both post-Keynesian and Mian and Sufi's views together, this paper emphasizes that, although there are clear differences between them, a careful examination reveals valuable complementarity which yields a better understanding of the rise of household debt in the US and the Great Recession.

Key words: household debt, the Great Recession, relative income hypothesis, inequality, securitization, subprime mortgage

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1 Introduction

The US economy experienced a very significant rise in household debt leading up to the Great Recession. Household debt as a share of gross domestic product, for example, increased from about 45 percent in 1975 to nearly 100 percent in 2006. This rise of household debt has been cited as the main source of the crisis of the Great Recession that started in 2007. Naturally, this major economic event has presented a significant intellectual challenge to both post-Keynesian and mainstream economists.[1]

This challenge was particularly unexpected by mainstream economists as many believed that the problem of economic fluctuations have been largely solved. For example, Robert Lucas stated, in his 2003 American Economic Associations presidential address, "macroeconomics in this original sense has succeeded: its central problem of depression prevention has been solved, for all practical purposes, and has in fact been solved for many decades"(Lucas, 2003, p.1). Mainstream standard dynamic stochastic general equilibrium models of business cycles have largely ignored financial sectors, particularly financial factors in household level even after the 2007 Financial Crisis (Mian and Sufi, 2010b, p.78).

Meanwhile, Atif Mian and Amir Sufi have produced a series of papers since 2009, that are perhaps the most influential and empirically oriented studies of mainstream economists on the issue of rise of household debt in the US and the Great Recession. In this paper, we compare and contrast some of the influential post-Keyneisan research on the rise of household debt and the Great Recession to that of Mian and Sufi. Within the post-Keynesian tradition, we cover the ideas of Hyman Minsky and later works by Minskyians, who extended Minsky's early ideas. We also cover post-Keynesian consumption behavior highlighting James Duesenberry's relative income hypothesis (Duesenberry, 1949) and income distribution dimension to understand the rise of household debt in the US. We examine their views on what caused household debt accumulation prior to the Great Recession and what should have been the appropriate policy response to the Great Recession. We highlight some of the important differences and commonalities in their views.

This paper will show that, although there are fundamental differences between them that stem from distinctions in theoretical backgrounds, their views also overlap. In fact, some of Mian and Sufi's empirical results provide affirmative evidence for post-Keynesian ideas. By weaving together post-Keynesian analyses with the empirical studies of Mian and Sufi, our paper also highlights the relevance and importance of a post-Keynesian understanding of the central economic problems of the Great Recession.

This is one of few studies to survey both post-Keynesian and mainstream studies together to understand an important economic event. However, due to space constraints, many interesting lines of post-Keynesian research cannot be surveyed in this paper. Our survey will focus mostly on the post-Keyneisan research that provide institutional and historical pictures.

Our paper is organized as follows. Section 2 presents post-Keynesian views, starting from Hyman Minsky's ideas. Some important Minskyian extensions are discussed subsequently. Post-Keynesian views on income inequality, the relative income hypothesis, and consumption behavior are also discussed at the end. Section 3 surveys Mian and Sufi's studies on the rise of household debt before the Great Recession. Section 4 discusses what would have been the right policy response to address the Great Recession according to both points of views. Commonalities and differences in their views are highlighted in section 5, while section 6 provides concluding comments.

2 Post-Keynesian Views

Post-Keynesians have long emphasized the integration of the real and financial sectors, and a possibility of instability arising from the financial sector. By utilizing and extending their existing frameworks, they have put forth insightful analyses of the rise of household debt and the Great Recession in the US. In this section, Hyman Minsky's ideas provide a starting point for our discussion. Some of the important Minskyian extensions are followed, and post-

Keynesian analyses emphasizing, income inequality, consumption, and the relative income hypothesis are discussed.

2.1 Hyman Minsky's View

> The processes which make for financial instability are an inescapable part of any decentralized capitalist economy (Minsky, 1982).

Hyman Minsky's original works are still highly relevant and the most important starting point for this literature, extending into various directions. As the above quote shows, Minsky saw the capitalism as an inherently unstable system. Minsky highlighted cash flow characterization of hedge-, speculative-, and ponzi-financing units. Economic entities, such as firms as Minsky initially emphasized, would go through these financing stages. As an economy experiences a prolonged period of stability, economic entities take more risky financial positions as stable economic conditions have rewarded their risk taking behavior handsomely, and hence they become more financially fragile. In other words, they take the positions of speculative- and ponzi-financing units from the most healthy financial position of hedge units.[2] The economy has, thus, become financially fragile and more susceptible to a financial crisis. 'Stability breeds instability,' and this is an inherent characteristics of the capitalist economy.

For Minsky, government intervention, such as fiscal expansion and liquidity injection by monetary authorities, is necessary to prevent the economy from falling into a deep recession. Through fiscal expansion and deficit spending, governments can provide a direct source of profit to firms.[3] Perhaps more importantly, central banks need to act as the 'lender of last resort' to the banking/financial sector, by providing enough liquidity to permit firms to roll over their existing debt and still acquire necessary financing for their operation. In this regard, Minsky can be seen as representing the bank-lending view, which will be discussed more in section 5.2.

> The central bank's function is to act as a lender of last resort and therefore to limit the losses due to the financial crisis which follows from the instability induced by the innovations during the boom. A combination of rapid central bank action to stabilize financial markets and rapid fiscal policy action to increase community liquidity will minimize the repercussions of the crisis upon consumption and investment expenditures. Thus a deep depression can be avoided. The function of central banks therefore is not to stabilize the economy so much as to act as a lender of last resort (Minsky, 1982, p.176).

Minsky (2008) is a republication of the notes Minsky informally prepared in 1987. In this paper, Minsky extended his analysis of financial evolution to consider securitization, prophetically ahead of his time. In this article, Minsky argued that securitization is a natural result from globalization and the monetarism of 1979 that sought to contain inflation by contracting money growth. Minsky (1996b) is the last article that shows his evolving view about the nature of capitalism. Minsky argued that the US economy has evolved into the stage of money manager capitalism.[4] However, the detailed elaboration and description of this stage is left to other Minskyian scholars.

2.2 Minskyian Extensions

Randall Wray, in a series of papers, extends the idea of money manager capitalism. This is a line of thought by Minsky that built upon the analysis of finance capitalism developed by Rudolf Hilferding, Thorstein Veblen, John Maynard Keynes, and John Kenneth Galbraith (Wray, 2011b, p.1). According to Wray's analysis , the US economy emerged out of the Great Depression and World War II with solid financial regulatory frameworks, lower private debt, big government spending, and sufficient wage income for workers to sustain a sufficient level of consumption. However, since the early 1970s, the US economy experienced a significant shift of economic regime. Unions and workers started to lose their collective bargaining power, resulting in stagnant real wage income; income and wealth inequality began to rise; government public spending started to slow down; trickle-down economics was promoted, emphasizing saving by richer, rentier households. Wray (2009) explains this change by adopting Galbraith (2008)'s concept of the predator state. According to this concept, a big government that is led by neoconservatives acts in the interest of money managers, and, under the slogan of laissez faire market economy, transformed the US economy into the stage of money manger capitalism. The US economy experienced a shift of power toward the financial sector and management through regulatory and policy changes. Following Tymoigne (2010, p.103-104), some of the regulatory changes Wray (2009, p.815) highlights, are: the Financial Modernisation Act of 1999 eliminating New Deal functional segregation; the Commodities Futures Modernization Act of 2000 which excluded new financial instruments from regulation; and, an amendment to the Employee Retirement Income Security Act of 2000 which allowed pension funds to purchase investment grade structured securities.

As Minsky (2008) points out, more recent forms of securitization also originated in the housing market, particularly in response to the interest rate hikes in 1979 under Paul Volcker monetarism. Bank funding ability was impaired due to the high interest rate environment, and hence they had to find a way to shift their assets off their balance sheets. Also, as the memory of the Great depression and World War II disappeared, and technological and communication innovation allowed increased access to credit, the US relaxed its attitude toward borrowing based consumption. Despite sluggish growth in government spending and wage income, the rise in debt-driven household consumption ushered in the so-called "Great Moderation," paving the way for the critical stage of money manager capitalism. In other words, 'stability breeds instability.' From this perspective, the *true* source of the problem for the Great Recession is not the unsustainable level of household debt accumulation or securitization, but the nature of capitalism (this time characterized by money manager capitalism) tending always towards a financially unstable state.

In sum, according to Wray's analysis, US capitalism evolved into money manager capitalism. In this environment, we saw the rise in financial products such as securitization. With fiscal restraint, a current account deficit, and rising income inequality, debt financed private spending became prevalent. The crisis of 2007 was thus the result of a specific phase of capitalism, money manger capitalism, not an accidental debt crisis. The unsustainable increase in household debt and the Great Recession were results of a long-term transformation, what Wray (2011a, p.6) calls, 'Minsky half-century.'

This long-wave view has become prominent for post-Keyneisans more recently. Palley (2011), for example, formulate Minsky's idea more explicitly from the long-wave perspective to understand the rise of household debt and the Great Recession. He distinguishes between short cycles and super cycles in interpreting the financial instability hypothesis. Palley relates Minsky's financing taxonomy (hedge, speculative and ponzi) with short cycles that an economy goes through more frequently in every business cycle, which he calls the Minsky basic cycle. A financial crisis, on the other hand, is a part of a super cycle that is associated with more fundamental structural changes through several business cycles. These fundamental structural changes involve various forms of regulatory relaxation in the financial sector and increasingly more risk-taking behavior. Particular aspects of each crisis is history specific - as in the Great Recession and an unsustainable accumulation of debt prior to that - but the true source of the problem is again capitalism itself, with its "Success breeds excess breeds failure"(Palley, 2011, p.32) characteristic.

Dymski (2010) provides another analysis, extending and modifying Minsky's ideas for the present context. Dymski highlights securitization and the spread of loans to minority and lower income households as the main cause for household debt accumulation and the Great recession. According to his analysis, the US banking system experienced dramatic changes starting in the 1980s after the loan crisis and deregulation. "Loan crises and deregulation in the 1980s brought about change: an end to geographic and product-line restrictions; bank failures and bank mergers across state lines; the decimation of the thrift industry. ⋯ The US system of mortgage finance was radically reshaped: lenders made loans to sell them, thereby also offloading financial risk"(p.245). Mortgage loans, which used to be held by lending banks prior to 1980s, became mortgage-backed securities (MBS) and were sold off into the secondary market. Furthermore "the onset of securitisation opened the door to the targeting of socially-excluded or vulnerable populations for financial exploitation. Those previously denied mortgage credit were now provided with high-cost, high-risk loans"(p.253). Beginning in the 1990s, with the spread of securitization, financial systems expanded the loans, often predatory and subprime, to minority and lower-income households that had previously been overlooked.

Dymski points out that banks are not the most leveraged units due to originate-and-distribute model of finance via securitization.[5] "These banks are not lenders in any traditional sense. They make loans that are sold off onto the markets: they originate financial risks but do not bear them" (Dymski, 2010, p.252). The most leveraged unit is subprime households with "nothing-down subprim loans" since they start with zero equity (p.252):[6]

> Banks are no longer the most leveraged units;instead, households with subprime mortgages are and SIVs fall between banks and subprime households (Dymski, 2010, p.252).

Liquidity injection to the banking/financial sector therefore, as Minsky envisioned the role of central bank as the lender of last resorts, was not sufficiently effective to address the Great Recession: "Minsky's ideas about stabilisation assume that in any crisis the Federal Reserve would have leverage over a banking system that represented the fulcrum of the economy's financing process. This has not been the case. Banks' outsourcing of much of their lending/borrowing has rendered an extensive roster of central-bank interventions ineffectual. Indeed, both 'big bank' methods and 'big government' policies have only limited damage and not triggered recovery"(Dymski, 2010, p.253).

2.3 Inequality, Consumption, and Relative Income Hypothesis

Minskyian analyses as discussed above, although recognizing the importance of the rise of debt-financed consumption for debt accumulation, do not explore it in detail. This dimension is emphasized and developed by researchers who have incorporated the idea of the relative income hypothesis by Duesenberry (1949) into post-Keynesian frameworks. According to the relative income hypothesis, consumption behavior is socially interdependent. Therefore one's consumption pattern may be affected by his/her consumption reference group. This is often referred as the consumption emulation effect, as well as the keeping up with the Jones effect. Also, according the relative income hypothesis, consumption behavior is path dependent. In other words, past consumption levels and pattern influence the current consumption behavior - also referred to as the habit formation or habit persistence theory (Marglin, 1984). Levine et al. (2010) extends the relative income hypothesis into the concept of expenditure cascades. According to this concept, as there are vertical layers of reference groups, one's consumption should be partly affected by a group which has a considerably higher level of income through the chain of reference groups.

Cynamon and Fazzari (2008) apply and extend Duesenberry' s relative income hypothesis in explaining contemporary household behavior. Consumer preferences endogenously evolve in a social context and hence households learn consumption patterns from social reference groups. In the current context, the social reference group is not limited to family members, friends, and neighbors on the same street. It has expanded through, for example, advertising and mass communication tools, whereby the consumption patterns of the richer population are more commonly exposed. The authors suggest that consumption and borrowing norms had shifted upward and become an important factor for the rise in consumer and household debt in the US. They point out that, although this provided a substantial macroeconomic stimulus since the 1980s, it has also increased household financial fragility.

Cynamon and Fazzari (2015a) provide a more in-depth elaboration on income inequality, consumption, and borrowing in the US. They provide a convincing argument through evidence showing that income inequality for the bottom 95 percent had widened since the middle 1980s through 2007. At the same time, they have sustained a consumption rate relative to disposable income. This implies a possibility that their indebtedness (debt to income ratio) and net worth had been on an unsustainable path. This is in contrast to the top 5 percent for whom income growth accelerated, debt-income ratios were stable, and net worth rose relative to income prior to the Great Recession (p.14).

Analytically, they link income inequality, the household balance sheet, and consumption flow using the following equation (p.8);

$$\frac{d}{dt}(\frac{D}{Y}) = \frac{\dot{A}}{Y} + \frac{C}{Y} - 1 + (i - \pi)\frac{D}{Y} - g_Y(\frac{D}{Y}) \tag{1}$$

where D is new borrowing after principal repayment, Y is nominal GDP, $\dot{A}$ is asset purchases minus asset sales, C is consumption, i is nominal interest rate, π is the inflation rate, and g_Y is the real growth rate of income. If there is a reduction in income growth for the bottom 95 percent, g_Y, ceteris paribus, their consumption relative to income will have to be lower to prevent the change of debt relative to income from accelerating.

[Figure 1 about here.]

Figure 1 shows the well-documented rising income inequality in the US, especially since the early 1980s. Under an environment of rising income inequality, workers, other things equal, will have to adjust their consumption behavior, as equation 1 describes. However, figure 2 shows that the consumption rate of the bottom 95 percent was quite stable despite rising income inequality until the Great Recession hit. On the other hand, the top 5 percent's consumption rate was volatile, showing evidence that this group smoothed their consumption relative to income. At the same time, as figure 3 shows, household debt relative to income for the bottom 95 percent increased very significantly from 75 percent to more than 175 percent, while the same measure for the top 5 percent was quite stable.

[Figure 2 about here.]

When the recession hit in 2007, the consumption of the bottom 95 percent, unlike prior recessions, declined significantly, as figure 2 shows. Cynamon and Fazzari argue that the observed consumption dynamics are the main reason why the US experienced a deeper recession. In other words, the data is consistent with the interpretation that "households in the bottom 95 percent were consuming and borrowing at unsustainable rates. When new borrowing dried up as the Great Recession began, the bottom 95 percent consumption rate was forced downwards" (Cynamon and Fazzari, 2015a, p.15). According to their analysis, inequality was central to the macroeconomic dynamics of the household debt accumulation and consumption before and during the Great Recession (Cynamon and Fazzari, 2015a, p.16).

> Again, we argue that the relationship between inequality and economic crisis was not a coincidence. The evidence implies that the bottom 95 percent responded to slower income growth and higher interest rates, beginning in the early 1980s, by taking on more debt rather than by reducing consumption enough to keep its debt-income ratio stable. This outcome, in a sense, temporarily rescued the US economy from the demand drag that many theories predict as a result of rising inequality. But the deteriorating balance sheets of the bottom 95 percent eventually set the stage for the Great Recession. ⋯ The rise of inequality is easily large enough that it could potentially account for the entire increase in bottom 95 percent debt leverage, an increase that spawned the Great Recession.(Cynamon and Fazzari, 2015a, p.17).

[Figure 3 about here.]

The preceding analysis raises the question of why the bottom 95 percent let their balance sheets deteriorate through borrowing in the environment of rising income inequality. Cynamon and Fazzari (2015a) explanation relies on the idea of habit persistence, expenditure cascades, and the relative income hypothesis. Thought the bottom 95 percent income growth slowed, due to habit persistence, this did not induce any significant change in consumption norms. Meanwhile, rising income inequality put upward pressure on their consumption pattern through the channels of consumption emulation and expenditure cascades, while innovations such as credit reporting systems and securitization created an unprecedented level of credit availability. This allowed a large population, through borrowing, to maintain consumption behavior dictated by consumption emulation, expenditure cascades, and habit formations.

> For an extended period, middle-income households who were falling behind high-income households were able to drive their leverage up without deviating from established norms of behaviors, in both spending and financing, that they observed in their reference groups. As the empirical results in section 4 demonstrate, however, these trends were on a collision course with reality. When the Great recession hit, the bottom 95 percent could no longer maintain consumption norms by borrowing. Credit availability collapsed quickly, forcing de-leveraging and reduced spending. (Cynamon and Fazzari, 2015a, p.20)

Cynamon and Fazzari (2015b) make essentially a same point based on their analysis in Cynamon and Fazzari (2015a); "from the early 1980s until the eve of the Great Recession, the bottom 95 percent maintained high consumption despite their stagnating income, postponing demand drag from rising inequality. The result was an ultimately unsustainable, but persistent, increase in household leverage and financial fragility Cynamon and Fazzari (2015b, p.177)." From their perspective, the inequality also explains the slow recovery of consumption spending and output in the US since the Great Recession as they point out that "the effect of inequality on demand generation was postponed by massive consumer borrowing for an extended period prior to the Great Recession, but it now is holding back output and employment Cynamon and Fazzari (2015b, p.180)"

The relative income hypothesis is a rather natural extension of the post-Keynesian theory of consumption that emphasizes heterogenous agents and differential saving rates. There has been considerable development of formal modeling of post-Keynesian variants to incorporate consumption behavior of the relative income hypothesis, expenditure cascades, and household borrowing. For example, Setterfield et al. (2016) and Setterfield and Kim (2016) incorporate consumption emulation and expenditure cascades into post-Keynesian growth models. They show that distributional changes between the Golden Age and the Neoliberal regimes and corresponding changes in consumption emulation behavior via expenditure cascades can make the economy unstable. Ryoo and Kim (2014) incorporates consumption emulation into the Kaldorian model of income distribution and growth, and analyzes macroeconomic instability and cycles due to the interaction of income distribution, consumption emulation, and the lending practices of banks.[7]

The emphasis on the linkage between income inequality and household debt accumulation we discussed above has been very influential and emphasized by numerous studies. However, it is noteworthy that Mason and Jayadev (2014) provide a different perspective. They apply a decomposition approach of public debt to household debt in the US over the period of 1929-2011. According to their accounting study, the rise in household debt-income ratio could be largely explained by the disinflation and higher debt service payment due to higher nominal interest rates on the existing stock of debt, not by a greater new net borrowing, for the period of 1980-1999; "our accounting implies that the rise in household debt-income ratios after 1980 is best interpreted as primarily reflecting the effects of disinflation and higher nominal interest rates on the existing household debt stock, rather than increased household borrowing" (Mason and Jayadev, 2014, p.214). In other words, their study point out that inequality-induced demand driven credit expansion, which is emphasized by Cynamon and Fazzari (2015a,b), may not provide an accurate picture of what happened in the US during this period. According to their study, US experienced significantly positive new net borrowing for the period of 2000 -2007, and this provides a positive evidence to Atif Mian and Amir Sufi's studies as the most of their studies focus on the same time period.

3 Atif Mian and Amir Sufi's View

Atif Mian and Amir Sufi, in a series of papers, have provided perhaps the most definitive and insightful studies, from mainstream perspectives, on the rise of household debt and the Great Recession in the US. Mian and Sufi (2009) empirically examine the competing explanations for subprime mortgage expansion using micro-data, focusing on the period between 2002-2005. Those competing explanations are: the income-based hypothesis, which suggests that the income prospects of subprime borrowers might have improved in the early 2000s; the supply-based hypothesis, which argues that there was a significant increase in the mortgage supply by lenders due to, for example, securitization; the expectation-based hypothesis which suggests that there was increased lending due to the expectation of increasing house prices. They gather and utilize zip code level data for 3,014 zip codes in 166 counties covering over 45 percent of aggregate home debt. They identify borrowers with a credit score below 660, as of 1996, as subprime borrowers, and divide their sample between subprime zip codes and prime zip codes based on the fraction of subprime borrowers. Subprime zip codes are in the highest quartile, while prime zip codes are in the lowest quartile. On average, the fraction of subprime borrowers in the subprime zip codes are 0.444, and in the prime ZIP codes are 0.159 (p.1456-1457).

[Figure 4 about here.]

Their key finding is that the supply-based hypothesis is most consistent with the data, and figure4 succinctly summarizes the results. The top left-hand panel plots the percentage of application denied in each ZIP code against the fraction of the population that were subprime borrowers in 1996. This plot shows that higher subprime population shares are associated with higher denial rates for credit. This indicates that there was initially credit rationing for subprime borrowers (p.1477). On the other hand, the top right-hand panel of figure4 plots the difference in denial rate for mortgage application between subprime and prime ZIP codes from 1996 to 2007. This plot shows that the loan denial rate for subprime

ZIP codes falls disproportionately from 2002 to 2005 compared to prime ZIP codes (p. 1479). In other words, there was significant credit expansion in subprime areas between 2002 and 2005.

The bottom left-hand panel of figure 4 plots the fraction of new mortgages sold to non-Government Sponsored Entity (GSE) investors, and the bottom right-hand panel of the figure plots the relative growth in mortgages, between subprime and prime ZIP codes, that are sold to non-GSE investors. The bottom left-hand panel indicates that there was a sharp increase in mortgages sold by originators to non-GSE investors between 2002 and 2005 (30 percent between 1996 and 2002 compared to 60 percent between 2002 and 2005). The bottom right-hand panel on the other hand shows the rapid relative increase of mortgages sold to non-GSE investors from subprime ZIP codes around the same period (p.1479). Furthermore, they document the evidence that these mortgages sold to non-GSE institutions from subprime areas were largely for securitization: subprime population share is positively correlated only with the change in mortgages sold by originators for securitization (p.1482). "The fraction of home purchase mortgages that were securitized by non-government sponsored enterprise (GSE) institutions rose from 3 percent to almost 20 percent from 2002 to 2005, before collapsing completely by 2008. $\cdots$ non-GSE securitization primarily targeted zip codes that had a large share of subprime borrowers" (Mian and Sufi, 2010a, p.52). In sum, Mian and Sufi provide concrete evidence of securitization as a reason for credit expansion in subprime areas. Furthermore, they also document that the change in mortgages sold for securitization is positively correlated with a subsequent increase in default rates in subprime ZIP codes (Mian and Sufi, 2009, p.1482). Securitization prevented lenders and borrowers from efficient renegotiation, and hence stressed borrowers were more likely to experience foreclosures if their mortgage was held in a securitization pool rather than on the balance sheet of an individual bank (Mian and Sufi, 2015b, p.139).

The sharp rise in securitization coincides exactly with the inversion in the correlation between credit and income growth in 2002 - from positive to negative. The period from

2002 to 2005 is the only period of negative correlation since 1991. Subprime ZIP codes with very high relative mortgage growth were particularly prone to experience lower income growth, and they also experienced significantly greater house price growth at the same time (Mian and Sufi, 2009, p.1487). In other words, there was a disconnect between income dynamics and house prices between 2002 and 2005, particularly within the subprime ZIP code areas. This timing again coincides with the time of expansion of subprime mortgage securitization. Based on these findings, Mian and Sufi (2009, p.1490) suggest that "the expansion of mortgage originations in subprime ZIP codes, driven by securitization, may itself be responsible for the relative house price growth in subprime areas."

Mian and Sufi (2011) investigate an additional dimension of household borrowing by estimating the effect of rising house prices on home equity-based borrowing between 2002 and 2007. They examine a random sample of 74,149 homeowners, who owned their homes as of 1997, in 2,307 ZIP codes from the end of 1997 until the end of 2008 (p.2132). Their conservative calculation suggests that total borrowing due to house price appreciation represents 53 percent of the overall increase in debt of homeowners from 2002 to 2006, which is 1.25 trillion dollars (p.2154). They also estimate that defaults due to the home equity-based borrowing by homeowners represent at least 39 percent of total new defaults in the economy during this sample period of 2002-2006 (p.2135). According to their study, low quality borrowers of low credit scores and high credit card usages (subprime borrowers) were the ones who borrowed aggressively against their rising home equity, and experienced higher default rates starting around 2006 (p.2143). They also explore how this equity-based borrowing is used. Their findings seem to suggest that "a large fraction of home-equity based borrowing is used for consumption or home improvement" (Mian and Sufi, 2011, p.2152). These results show that a large part of the default crisis is due to households, especially subprime households, borrowing for consumption related expenditures against home price appreciation, which is driven by securitization and the expansion of credit supply as reported by Mian and Sufi (2009).

Atif Mian and Trebbi (2013) explores a political dimension to understand why there was a significant expansion of subprime mortgages right before the crisis. They find that campaign contributions from the mortgage industry and subprime borrowers in their congressional districts seemed to influence the voting behavior of representatives and hence shaped policy that helped to promote the expansion of subprime mortgages. According to their study, there was a sharp increase in mortgage industry campaign contributions and campaign lobby expenditures between 2002 and 2006: mortgage industry campaign contributions increased 80 percent compared to the 40 percent increase of non-mortgage financial firms, and the lobbying expenditure by mortgage industry increased significantly faster than non-mortgage financial industry, from 25 million dollars in 2001 to almost 50 million dollars in 2004 (p.388). "The sharp increase in mortgage industry campaign contributions and campaign lobby expenditure coincides with a sharp increase in securitization and mortgage lending to high subprime zip codes that occurs from 2001 to 2006" (p.388).

More specifically, beginning in the 107th Congress (2001-2002) until 2007, there were significant campaign contributions from the mortgage industry to representatives from the districts with a high subprime borrower share (Atif Mian and Trebbi, 2013, p.406): "a one standard deviation increase in the fraction of subprime borrowers in a given district leads to an 80 percentage point increase in the growth of mortgage campaign contributions from 2002-2006" (p.376). The authors also document that, between 2000-2004, the fraction of subprime borrowers in congressional districts and the level of campaign contributions from the mortgage industry seems to have had a stronger influence on the voting patterns of representatives on housing and housing finance related legislation. This period again coincides with the time of subprime mortgage expansion and securitization. In sum, their results suggest that "constituent interests, measured with the fraction of subprime borrowers in a given congressional district before the subprime mortgage expansion, and special interests, measured with campaign contributions from the mortgage industry, both helped to shape government policies that encouraged the rapid growth of subprime mortgage credit"

(Atif Mian and Trebbi, 2013, p.375).

Mian and Sufi identify government as a main source of 'shocks' that encouraged the debt expansion: "debt is cheap because the government massively subsidizes its use" (Mian and Sufi, 2015b, p.182); "the government provides large tax subsides to debt financing, and this encourages a financial system overly reliant on debt contracts"(Mian and Sufi, 2015b, p.180). This view has a similarity with Rajan (2010)'s argument that debt expansion to lower income households are due to government's policies to expand credit to them in responding to growing income inequality in the US since the early 1980s. However, it should be noted that, unlike Rajan (2010), Mian and Sufi's studies do not highlight the income inequality dimension as a main factor for inducing credit expansion.

In sum, Mian and Sufi identify three related factors in the rise of household debt between 2001 to 2007. First, there was a significant expansion of the supply of credit due to securitization, especially to subprime borrowers, pulling them into housing market. This, in turn, pushed up house prices especially in the areas populated more with subprime borrowers. Second, existing homeowners made use of the opportunity of increasing house prices and low interest rates to extract home equity for consumption expenditures and home improvement. Third, starting in 2000, campaign contributions to representatives in high subprime borrower share areas from the mortgage industry expanded, and this seemed to influence congressional voting behaviors in favor of the mortgage industry.

4 Policy Responses

According to Mian snd Sufi, the main reason for such a significant decline of real economic activity and a deep recession was foremost due to the expenditure reduction by distressed households with high indebtedness and foreclosures as well as the lack of credit availability. Mian and Sufi (2010b) find that the growth in household leverage from 2002 to 2006 and household dependence on credit card borrowing as of 2006 are quantitatively sufficient to explain the entire rise in household defaults, the drop in house prices, and the fall in auto sales (p. 78). High leverage counties experienced considerably more severe house default rates beginning in the second quarter of 2006 and a very significant drop in house prices starting in 2006 compared to low leverage counties.[8] At the same time, high leverage counties experienced a considerably more severe reduction in economic activity, measured by auto sales growth, new housing permits growth and unemployment, compared to low leverage counties, although both groups saw serious reductions in economic activity according to those measures during the last part of the recession.

Mian and Sufi (2015a) investigate the effect of house foreclosures on house prices and economic activities.[9] Their results indicate that foreclosures led to a marked drop in house prices, deteriorating the balance sheet of households and their net worth, and hence had significantly negative impact on real economic activity such as residential investment and consumer demand. Specifically, according to their calculation, from 2007 to 2009, "foreclosures were responsible for 33 percent of the decline in house prices, 20 percent of the decline in residential investment,and 20 percent of the decline in auto sales" (p.2590).

Based on these studies, Mian and Sufi advocate for, what we call, 'the aggregate-demand view,' which is the perspective that the main driver of the Great Recession was a reduction of consumption by distressed households who experienced a significant reduction of housing prices and became underwater on their mortgages. The population who experienced this stress was generally lower-income households who have a higher marginal propensity to consume (MPC) out of their wealth, which is dominated by their housing wealth, compared with the lenders who are richer and have a lower MPC out of their wealth: Mian and Sufi (2013, p.1717) find that "the MPC for households in ZIP codes with an average adjusted gross income (AGI) less than 35,000 dollars is almost three times as large as that for households in ZIP codes with an average AGI greater than 200,000 dollars";"ZIP codes that entered the Great Recession with a housing loan-to-value (LTV) ratio of 90 percent had an MPC out of housing wealth that was three times as large as the MPC of households in ZIP codes with only a 30 percent housing LTV ratio" (Mian and Sufi, 2013, p.1689). Those who are underwater on their mortgages naturally reduce their consumption. Through the multiplier effect, this causes reduction in employment and a deeper recession. From the aggregate-demand view, the solution to the Great recession is to reduce the debt burden of distressed households through write-down and restructuring of their mortgage debt to prevent foreclosure and reduction of consumption.[10] In other words, restructuring debt in favor of borrowers would have promoted more equal sharing of losses and "transferred wealth from people with very low marginal propensities to consume to people with very high marginal propensities to consume. This would have boosted overall demand. A creditor barely cuts spending when a dollar is taken away, but a borrower spends aggressively out of a dollar gained. ⋯ indebted households had MPCs out of wealth that were three to five times larger than others" (Mian and Sufi, 2015b, p.141).

This aggregate-demand view has some similarity with, what we call, 'the inequality view,' a line of thinking presented by post-Keynesian researchers that emphasizes rising income inequality, especially in its association with consumption behavior described by the relative income hypothesis, as an important reason for debt-accumulation prior to the Great Recession. Cynamon and Fazzari (2015b, p.180) points out the slow recovery of the US is due to a demand generation problem, largely because of the stagnation of the bottom 95 percent consumption growth. From this perspective, the real solution to the problem must work toward reducing income inequality in the US: "a first step towards resolving the problem is to have a clear understanding that rising inequality goes beyond the issue of social justice. ⋯ greater inequality also compromises the demand engine that was necessary for acceptable macroeconomic results in the USA prior to the Great Recession, and greater inequality threatens demand growth and employment going forwards" (Cynamon and Fazzari, 2015a, p.21). Based on this understanding, Cynamon and Setterfield (2013, p.9) argue that "public policy should strive to revive the income share of working and middle-class households, and to realign wage and productivity growth. This would allow for sustainable growth in household consumption expenditures. On the domestic front, rethinking the changes in labor law that weakened the bargaining power of workers over the past 30 years could help reach this goal."

On the other hand, post-Keynesians extending the thesis of money manger capitalism tend to emphasize, following the original idea of Hyman Minsky, 'the bank-lending view'[11], which is one that emphasizes the lending channel of bank and financial sectors. For business to be able to sustain, they will need access to credit facilities from the financial sector. Therefore, to mitigate the effect of financial crisis, it is the most important to insure that the banking sector has healthy liquidity, thus allowing the sector to continue lending to other businesses. In this view, central banks must work as the 'lender of last resort' to the banking/financial sector, providing enough liquidity to allow firms to roll over their existing debt and still acquire necessary financing for their operations.

However, these post-Keynesian scholars also understand, for the longer term, the importance of solving the fundamental problem of income inequality and demand generation: "we need policy that promotes rising wages for the bottom half so that borrowing is less necessary to achieve middle class living standards, and policy that promotes employment"(Wray, 2009, p.826). Minsky (1996b, p.4) advocated full employment based on "special employment programs of the federal, state and local government." This idea is extended into the advocacy of 'employer of last resort' program by Minskyian scholars (Wray, 2011a). In this jobs program, "government would offer a perfectly elastic supply of jobs at a basic program wage. Anyone willing to work at that wage would be guaranteed a job" (Wray, 2011a, p.11); this program would provide "useful services and public infrastructure, improving living standards" (p.11). It would be also a stabilizing force by providing a decent wage to finance consumption.

5 Highlighting Common Views and Differences

In this section, based on our survey of post-Keynesian ideas and Mian and Sufi's analyses above, we highlight common views and differences between them. By comparing and contrasting them, we also speculate on the possibility of deriving a synthetic understanding.

5.1 Common Views

Securitization is perceived to be an important driver for household debt accumulation for both post-Keynesians and Mian and Sufi. Wray (2008) emphasizes the importance of securitization, following Minsky (2008), in the expansion of lending to the borrowers, such as lower income and minorities, who previously did not have access to such credit. Dymski (2010) put forth a similar argument especially in relation to minority and lower income households. While their arguments are convincing and insightful, there are no systematic empirical studies to investigate this channel of securitization for credit expansion. In fact, the series of studies by Mian and Sufi mentioned in this paper provides concrete evidence for the prominent role of securitization in expanding credit to subprime borrowers.[12] Both Mian and Sufi and post-Keynesians such as Dymski also realize that securitization makes it difficult for renegotiation of a mortgage, and hence stressed borrowers were more likely to experience foreclosures if their mortgages were held in a securitization pool (See Mian and Sufi (2015b, p.139) and Dymski (2010, p.250)).

Dymski (2010) as well as Mian and Sufi are skeptical of the bank-lending view. Dymski argues that households with subprime mortgages were the most leveraged economic units, not banks, as banks sold off the loans they made to security markets. Therefore central bank's policy that provided liquidity to the financial system was not sufficient to contain the Great Recession. Mian and Sufi, on the other hand, perceive that some of the programs of the Federal Reserve and US treasury were needed to prevent the financial system from bank-runs and protect payment system; however, their view is that the main policy focus should have been on reducing the burden of indebted households. In their view, the lack of aggregate demand, due to distressed households, was at the center of the Great Recession. Mian and Sufi's argument also shares some similarities with the post-Keyneisans view (such as Cynamon and Fazzari (2015a)), which argues that the main cause of the recession and slow recovery was stagnant consumption from indebted working and middle-class households. This similarity is explored more in section 5.3.

As mentioned in section 4 there is a similarity between the aggregate-demand view by Mian and Sufi and the inequality view by post-Keynesians. Both emphasizes that generation of effective demand through consumption is the key solution for the great recession. For this reason, as we mentioned, Mian and Sufi advocates the restructuring of mortgage debt in favor of borrowers to boost their consumption, and post-Keynesians argue for policies to reduce income inequality. However, there is is also a fundamental difference as well regarding their views on the importance of demand, and this is explained further below in section 5.2.

It is also noteworthy that Mian and Sufi's aggregate-demand view is, in terms of its emphasis of debt burden on consumption, somewhat similar to the post-Keynesian idea emphasizing the role of debt in a financial theory of business cycle. Palley (1994) for example emphasizes different MPC between debtors and rentiers in a linear multiplier-accelerator model. He shows that rising debt service burden reduces consumption and output level as there is a transfer of income from high MPC agents (debtors) to low MPC agents (rentiers), and this provides a mechanism for a credit-driven cyclical process of output.

Mian and Sufi (2010a, p.55) argue that political institutions influenced by the financial industry will unlikely to impose proper losses on the financial industry, and hence credit-driven cycles may be a recurring feature of the economy. This argument can be also related to what Pollin (1997) calls the 'Minsky paradox': government intervention and the lender of last resort function of the central bank will validate fragile financial positions of economic agents, so that risky financial practices are allowed to continue or even get worse. "Government policy is called on increasingly to bail out the financial system and thereby avoid a depression, but this very policy encourages more fragility and thus increases the burden placed on future policy interventions" (Pollin, 1997, p.85).

5.2 Differences

Although there are some common views, there are also clear distinctions stemming from the authors different-views on capitalism and the theoretical frameworks that they adopt. First of all, there is a clear difference in terms of time-frame under consideration. Mian and Sufi's studies focus on the period of 2002-2007. Atif Mian and Verner (Forthcoming) is the only excerption among Mian and Sufi's studies as they use panel data of 30 countries from 1960 to 2000. However, they again focus on the medium run effect, not the long run effect. They utilize a Vector Autoregression (VAR) of the log real Gross Domestic Product (GDP), the level of household debt to GDP, and non-financial firm debt to GDP without any consideration of long run relationship such as cointegration. They also utilize a single equation framework only to capture, for a given time, the effect of rise in household debt over last three years to the subsequence GDP growth over three years. They are very clear, throughout the paper. that their focus of the paper is to capture the medium run effect of the rise of household debt to output, not detecting any long run trend.

On the other hand, post-Keynesians look at a much longer time horizon and their investigation focus on the long-term trend. The money manager capitalism framework focuses on the whole post-War period, from the 1950s until the Great Recession - the 'Minsky half-century.' Dymski's focus starts with the 1980s. Cynamon and Fazzari also utilize data starting in the 1980s. This difference in the time period considered in the respective analyses is of importance to this discussion. Post-Keynesian economists provide historical and institutional analysis tracing back to these years as an origin of crisis because of their views on the incomplete nature of capitalism. Mian and Sufi's view of crisis, on the other hand, is from the mainstream perspective of business cycles which is driven by unforseen economic events, often called 'shocks.'

For post-Keynesians, financial crisis is an endogenous phenomenon although some details of it should be different due to different historical circumstances and institutions. However, mainstream economists such as Mian and Sufi perceive that a financial crisis is caused by an exogenous shock: "the advent of subprime mortgage securitization represented a credit supply shock that provided new home purchase financing for a segment of the population that traditionally was unable to obtain mortgages" (Mian and Sufi, 2010b, p.79). Mian and Sufi therefore need to identify such shocks and Mian and Sufi (2009) and Atif Mian and Trebbi (2013) we discussed in section 3 are in fact their attempt to do so. Atif Mian and Verner (Forthcoming), which deals with the panel data set of 30 countries, also examine the data in the light of possible shocks suggested by the mainstream theoretical literature. They provide a supportive argument for credit supply shocks that induced credit expansion. For example, they document that "booms in household debt that are "unexplained" by GDP growth and non-financial firm debt are systematically related to low interest rate environments" (p.23), and argue that this is a compelling evidence for a positive credit supply shock that raises the household debt-GDP ratio (p.25). Mian and Sufi (2015b, ch.7) also identify a capital inflow for safe assets after 1997 Asian Financial Crisis started in Thai and securitization of mortgages as credit supply shocks that allowed credit expansion in the US prior to the Great Recession.

For post-Keynesians, identification of these kind of shocks seems to be less important, as the true source of the endogenous financial crisis comes from the 'very nature' of capitalism: "many accounts blame subprime mortgages (home loans made to riskier borrowers, typically low-income households) for the global financial collapse but that is obviously much too simple" (Wray, 2011a, p.7). This difference is also closely related to the idea of endogenous money and credits view of post-Keynesians and the view of exogenous credit supply constraints of Mian and Sufi and mainstream in general.

From the post-Keynesian endogenous money view[13], money is created through the lending by banks. In other words, the supply of money "is determined by the demand for bank credit (loans)"(Lavoie, 2014a, p.57). The expansion of credit, accumulation of debt, and consequential increase in financial fragility is therefore a natural part of system. The potential for financial crisis to occur is always there in the system, and hence it is an endogenous phenomenon, although what induces the unsustainable level of credit expansion and debt accumulation would depend on the different historical circumstances. On the other hands, for Mian and Sufi, as they seem to believe that the credit supply is constrained, unsustainable level of credit expansion and debt accumulation, and hence financial crisis are an abnormal event that are caused by unexpected exogenous factors.

Income inequality has been an important reason for household borrowing and debt accumulation for post-Keynesians. (See, additional to the studies discussed above, among others Palley (2002); Brown (2008); Barba and Pivetti (2009); van Treeck (2014)). Mian and Sufi (2009) documents some evidence of increasing income inequality, as they find that, between 2002-2005, "high-subprime share ZIP codes experience relative declines in income, employment, and establishment growth compared to other ZIP codes in the same country. In other words, mortgage origination growth is stronger in high subprime ZIP codes despite relatively worsening income, employment, and business opportunities in these areas"(p. 1468). However, there is no attempt in their published papers in academic journals, to date, by Mian and Sufi to delve further into income inequality as a possible driver of household borrowing.

(Mian and Sufi, 2015b, p.194) briefly mention that, in the afterword of their more general audience book, the US experienced a rise in inequality and debt (government and household) together since 1980s; "the relationship between the raise in inequality and the rise in total debt in the United States is a close one"(Mian and Sufi, 2015b, p.194). From their perspective, this rising inequality provided a source of credit expansion as the wealthy was able to save more, and borrowing and hence debt grew consequently. In this sense, Mian and Sufi see that income inequality and consequential increase in wealth inequality provided a source of credit supply expansion, although this point is made quite briefly. Note that this is again related to the view of supply side credit constraints emphasized by Mian and Sufi, which is different from the endogenous money view of post-Keynesians. From the endogenous money perspective, the supply of money is determined by the demand of credits, and, as mentioned in section 2, inequality has been emphasized by post-Keynesians as a driver of credit demand.

In mainstream accounts, the permanent income/life cycle theory of consumption is still a dominant way of thinking about consumption behavior. As discussed earlier in this paper, Mian and Sufi (2011) find very significant borrowing and debt accumulation through home equity in the environment of rising house prices and relative income decline in subprime areas compared to prime areas and that those credits were mostly used for consumption expenditures and home improvement. However, they cannot properly explain this phenomenon through the neoclassical theory of consumption behavior. In fact, some of their empirical results are inconsistent with life cycle models: "the evidence suggests that the borrowing of older consumers is less responsive to house price growth than that of young consumers, which is inconsistent with life-cycle models of consumer financial behavior" (Mian and Sufi, 2011, p.2145). However, for post-Keynesians, the relative income hypothesis is naturally compatible with their theoretical frameworks,[14] and hence can provide a coherent theoretical explanation, via consumption behavior, for rising household borrowing and indebtedness in the environment of rising income inequality.[15]

There are also quite different views on fiscal spending. For post-Keynesians, in addition to the role of central banks as a lender of last resort, it is 'critical' for government to sustain demand and business profit through deficit spending during the recession and crisis. "The combination of the big bank and the big government helps to prevent a financial crisis from turning into a deep downturn. The big government's deficit puts a floor to falling income and profits, and the big bank's lending relieves pressure in financial markets" (Wray, 2011a, p.5). Furthermore, even during normal times, post-Keynesians in general view large government spending favorably as a source to generate and sustain demand, income, and profit.[16]

Mian and Sufi realize the positive aspect of fiscal expansion during the crisis. "So fiscal stimulus can help, and efforts to impose austerity in the midst of a levered-losses episodes are counterproductive" (Mian and Sufi, 2015b, p.163). However their view on fiscal expansion is quite skeptical in general due to their acceptance of the Ricardian Equivalence (Barro, 1975): "most economists agree that in normal times government spending has little effect on the economy, because it crowds out private spending and because households understand that they eventually have to pay higher taxes to finance the spending. If anything, government spending may hurt in normal times because it distorts incentives through taxation" (Mian and Sufi, 2015b, p.162); "further, government spending must eventually be paid for by someone through taxes. Unless those taxes fall on creditors in the economy who were responsible for the housing boom, fiscal policy fails to replicate the transfer from creditors to debtors that most effectively boosts aggregate demand" (Mian and Sufi, 2015b, p.164). Mian and Sufi (Forthcoming) is their only study that examines the effect of fiscal stimulus, and they do so in the context of 2009 Cars Allowance Rebate System program.[17] Their study finds that there was no cumulative effect of the program on car purchases within a year right after the program implemented. Furthermore, this particular form of stimulus had no effect on employment, house prices, and household defaults rates.

This different view on the fiscal policy is also related to the more fundamental difference between Mian and Sufi (and mainstream in general) and post-Keynesians with respect to output determination. From the post-Keynesian framework, demand is the main determinant of output not only in the short run, but also in the long run. Mian and Sufi view that output is determined by the supply side in general and demand driven output determination is a special case due to frictions such as nominal rigidities and monetary policy constraints. In other words, economic activity is demand-driven only under a certain circumstance such as the zero-lower bound (Mian and Sufi, 2015b, p.54).

One of the main highlights of Mian and Sufi's contributions is to utilize micro data to correctly identify the channel and mechanism working at the macro level regarding the debt explosion and the Great Recession. In fact, by doing so, they provide evidences consistent with some post-Keynesian ideas, as discussed in this paper. The use of micro data in post-Keynesian macro studies is mostly absent.[18] the importance of heterogeneity in economic agents has long been recognized by post-Keynesians, unlike mainstream economists, and utilizing micro-data to highlight the effect of heterogeneous labor and households would possibly be a promising research venue.[19]

5.3 Synthetic Understanding Possible?

As we discussed above, there are clear differences between post-Keynesians and Mian and Sufi, but there also seem to be significant complementarity in their views allowing for the possibility of a synthesized understanding of the rise of household debt and the Great Recession in the US.

Hyman Minsky did not emphasize the importance of household debt as his financial instability hypothesis mostly concerned business debt and banking-financial sectors based on his observation of the real world in his time. Therefore, the Minsky and Minskyian's suggestion of "refinancing the markets or institutions"(Minsky, 1982, p.xxi) is mostly understood as the central bank acting as a lender of last resort to provide liquidity to troubled banking and financial institutions. However, Minsky realized later the potentially important role of household debt in the course of business cycle dynamics (Minsky, 1996a). Minsky's idea of refinancing the markets or institutions could be more broadly interpreted as 'refinancing the household sector,' and hence consistent with Mian and Sufi's argument about the need to reduce the debt burden of distressed households through write-down and restructuring of their mortgage debt to prevent foreclosures.

Mian and Suffi's studies point out that a main cause of the recession was the reduction of cash flow to businesses due to dramatic consumption decrease by distressed households who faced a very large fall in housing prices and even foreclosures. This argument could be incorporated into the Minskyian cash flow characterization of hedge, speculative and Ponzi financing. The lack of demand and resulting cash flow will generate, what Minsky called, speculative and ponzi financing of business, generating reduction of employment, and, through the multiplier process, create more severe recessionary trends. Mian and Sufi (2014) for example document that counties with the largest net worth drop experienced, between 2007 and 2009, the most severe decline in employment in nontradable industries such as retail- and restaurant-related ones. This is due to the reduction of consumer demand induced either by the reduction of net worth or tighter credit constraints induced by the housing price decline as reported by Mian and Sufi (2013). "This knock-on effect on local nontradable employment further depresses local spending" (Mian and Sufi, 2013, p.1690), and these negative effects spread out to tradable industries (which produce goods for national demands such as, for example, autos and home appliances) as well as the areas that did not experience a housing price collapse (Mian and Sufi, 2015b, ch.5).

As we talked about in section 5, Mian and Sufi (2009) document evidence of increasing inequality, though they do not emphasize inequality dimension as a cause of household borrowing, unlike post-Keynesians who especially emphasizes consumption behavior based on the relative income hypothesis. However, Mian and Sufi's solution, advocating debt restructuring and write-down of household debt, is based on a wealth transfer between the borrowers (lower income and wealth households) and the lenders (higher income and wealth households) due to their finding of significant difference in MPCs between poorer households and richer households:"wealthier and richer households have a significantly smaller MPC out of housing wealth" (Mian and Sufi, 2013, p.1716). They realize that "such heterogeneity in the MPC implies that the distribution of dollar losses across the economy matters for consumption dynamics" (Mian and Sufi, 2013, p.1688).

Inequality and demand generating processes have long been a center piece of post-Keynesian thoughts. They have long recognized the importance of distribution in creating and sustaining demand, and often advocated distribution favoring wage-earning, lower-income households (naturally borrowers in the present context).[20] The importance of distribution and inequality is well reflected in post-Keynesian analyses of consumption incorporating the relative income hypothesis, emulation, and expenditure cascades as discussed above. Although Mian and Sufi do not emphasize inequality as a cause of household indebtedness unlike post-Keynesians, distribution and demand generation seem to provide another interesting intersection point between post-Keynesians and Mian and Sufi's understanding of the Great Recession that might be explored.

6 Conclusion

The Great Recession and the unprecedented level of household debt prior to it have provided a great intellectual challenge to the economic profession. In this article, we surveyed some of important post-Keynesian analyses and Atif Mian and Amir Sufi's a series of innovative empirical works. We started with Hyman Minsky's original ideas, still highly relevant, and surveyed some Minskyian extensions. Post-Keynesian ideas emphasizing the relative income hypothesis, income inequality and consumption behaviors were also discussed. Mian and Sufi's series of works were surveyed, and differences and commonalities between post-Keyneisan and Mian and Sufi's views were highlighted.

There are a number of clear and significant differences between post-Keynesian and Mian and Sufi' views largely coming from their theoretical differences. However, there are some overlaps as well, and empirical results by Mian and Sufi can be seen as providing supportive empirical evidence for some post-Keynesian arguments and analyses such as securitization for credit expansion, differential MPC between borrowers and lenders, the nature of crisis that renders the effectiveness of bank saving policies, and the linkage between inequality, distribution, and aggregate demand.

Post-Keynesians understand that the Great Recession and household debt accumulation were not simply due to unexpected shocks and an abnormal one-time event. They rightly emphasize that, for an appropriate analysis, we need to provide broad institutional and historical pictures, as instability is a fundamental part of the capitalist system. Mian and

Sufi's works, although they lack such perspectives, provide concrete empirical works that emphasize a heterogeneity of households, distribution and demand, and the political process. Together they seem to provide, rather than being simply in conflict due to their theoretical differences, a complementary analysis for understanding the unprecedented household debt accumulation and the Great Recession in the US. These intersection points, one could hope, provide a venue for fruitful future research endeavors.

Notes

[1]In post-Keynesian and heterodox traditions, even before the crisis, a substantial body of research identified the connection between household debt and macroeconomic stability. See, for example, Palley (1994); Dutt (2005, 2006); Cynamon and Fazzari (2008); Barba and Pivetti (2009).

[2]Productive enterprises can go through speculative and ponzi financing position during their operation due to the time lag between the sales of their products and initial devolvement of their products. Therefore, such characterization of firms financial position is understood as current and expected cash flow in term of firms income, and current and expected cash commitments in terms of firms expenditure. See for example Minsky (1993).

[3]This argument is based on Kalecki's profit equation. See Kalecki (1965, ch.7)

[4]Minsky (1996b, p.3) states different stages of capitalism: "commercial capitalism, industrial capitalism and wild cat financing, finance capitalism and state financing, paternalistic, managerial, and welfare state capitalism, and money manger capitalism." The characteristics of money manager of capitalism are in his own words (Minsky, 1996b, p.3): "almost all business is organized as corporation; dominant proportions of liabilities of corporations are held either by financial institutions, such as banks and insurance companies, or by mutual and pension funds; the intrusion of a new layer of intermediation, the pension and mutual funds, into the financial structure is prevalent; funds are bound only by contract as to what assets they can own and what activities they can engage in; the stated aim of fund managers is to maximize the value of the investments of the holders of liabilities; the performance of a fund and of fund managers is measured by the total return on assets, a combination of dividends and interest received and appreciation in per share value."

[5]Dymski (2010) argues that Structured Investment Vehicle (SIV) funds, after subprime

households, are more indebted units than banks. However, note that SIVs were created by banks, and, when their cash flows turned negative during the crisis, they were absorbed by banks which created them and made the balance sheet of banks worse. This point is not emphasized by Dymski although he briefly mentions this (p.252).

[6]Subprime households are the term used by Dymski to refer "households that purchased homes without pledging any collateral" (Dymski, 2010, p.252).

[7]For related studies, see also Kapeller and Schütz (2015) and Setterfield and Kim (Forthcoming).

[8]High leverage counties are "top 10 percent of countries by the increase in the debt-to-income ratio from 2002:Q4 to 2006:Q4. Low-leverage growth counties are in the bottom 10 percent based on the same measure" (Mian and Sufi, 2010b, p.89).

[9]They use the state-level difference on judicial versus non-judicial foreclosure law as an instrument to measure the impact of foreclosures on house prices and economic activities. There is a stark difference in the foreclosure process between judicial and non-judicial property. In judicial foreclosure states, a lender must sue a borrower in court before conducting an auction to sell the property. In non-judicial foreclosure states, lenders obtain the automatic right to sell the delinquent property after providing only a notice of sale to the borrower (Mian and Sufi, 2015a, p.2588).

[10]Mian and Sufi (2010b) test another influential mainstream argument for the deep recession, financial accelerator effect Bernanke and Gertler (1989). According to the financial accelerator effect argument, the main recessionary force was the reduction of business credit as the local banks became more distressed due to mortgage defaults and limited availability of credit. Mian and Sufi's results are inconsistent with this view, and the authors provide additional explanations of why they believe financial accelerator effect was not the main force for the recession.

[11]See Mian and Sufi (2015b), especially chapter 9.

[12]Shin (2009) provides a similar argument. He argues that securitization reduces perceived credit risk and it led to an increased demand for securities products such as mortgage-backed securities.

[13]The studies on endogenous money and credits have generated a huge literature, and we will not delve into any details here. For a survey, see Lavoie (2014b, ch.4).

[14]See, for example, Lavoie (1994)

[15]In fairness, there has been some attempt to incorporate the relative income hypothesis into the mainstream life-cycle hypothesis although it is still not a part of dominant thinking. For example, see Dybvig (1995) and Alvarez-Cuadrado and Long (2011).

[16]This view is again based on Kelecki's profit equation which shows, at the aggregate level, net profits equal investment plus net export plus government's deficit plus consumption out of profit income minus saving out of wage income.

[17]In this program, government paid car dealers 3,500 dollars to 4,500 dollars for every fuel inefficient vehicles traded by consumers for more fuel efficient vehicles (Mian and Sufi, Forthcoming, p.1).

[18]There are very significant differences in available resources for research. One of the reasons Mian and Sufi and other mainstream economists could perform such large micro-data analyses is their resources availability, which is mostly not available for post-Keynesian and heterodox researchers.

[19]The importance of micro-level behavior in understanding macro problems of cycles and crises is also an important motivation for post-Keynesian studies utilizing agent-based modeling approaches. Mian and Sufi's micro empirical studies could be complementary, for example, to guide the model set-up and parameter values for simulating post-Keynesian

agent-based models.

[20]There is a vast literature on this subject, often classified as wage-led vs. profit-led growth. See, for example, Blecker (1989); Bhaduri and Marglin (1990b,a); Blecker (2002) among many others.

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A Figures

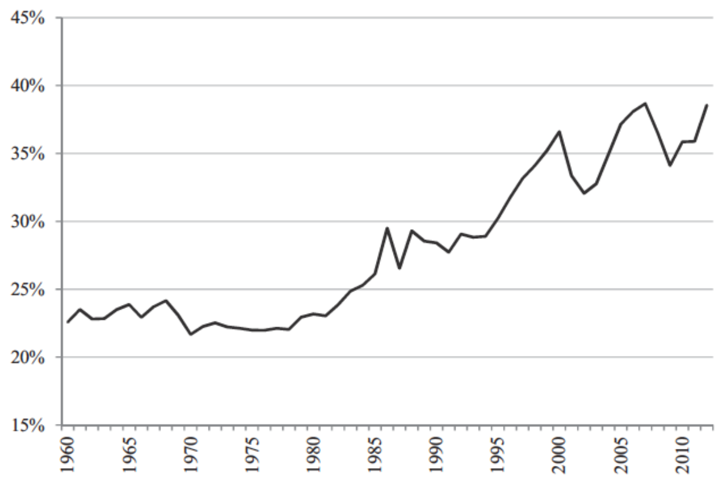

Figure 1: Top 5 percent income share. Source: Cynamon and Fazzari (2015a)

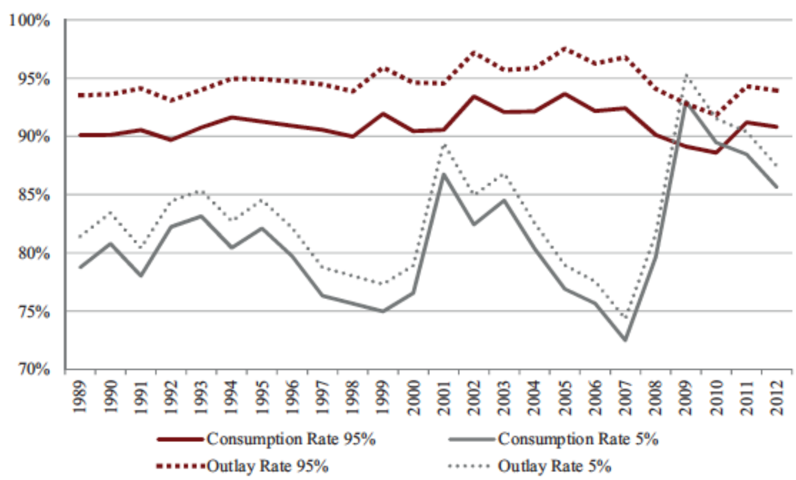

Figure 2: Disaggregated personal consumption and outlay rates. Source: Cynamon and Fazzari (2015a)

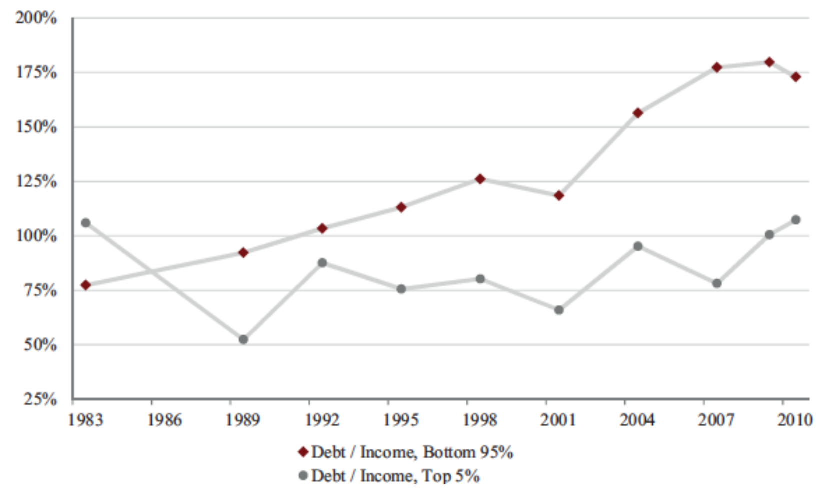

Figure 3: Household debt to disposable income. Source: Cynamon and Fazzari (2015a)

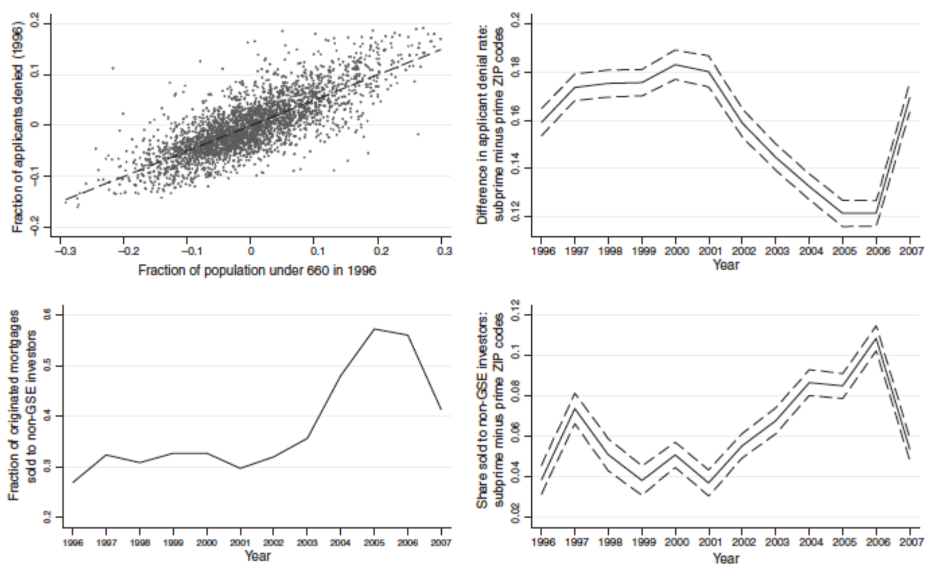

Figure 4: Relaxation in Borrower Credit Constraints. Source: Mian and Sufi (2009)