

# Aggregate Saving and Income Inequality: What are the Links?\*

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## Abstract

In this paper, I consider two important policy issues that have hitherto been treated separately: rising income inequality and falling personal saving rates. I ask whether worsening of the income distribution in the United States was a factor contributing to the rising consumption–income ratio from 1980s until the recent economic crisis. I explore several mechanisms through which changes in income and wealth distribution and the consumption–income ratio may be related, and provide tentative answers to whether these mechanisms may in part account for the rising consumption–income ratio in the United States. I also provide international evidence suggesting that the linkages explored in this paper have broader implications beyond the U.S. case.

*Keywords:* saving rate; income inequality; wealth inequality; consumption–income ratio.

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In the wake of the recent economic recession of 2008–2009, many commentators singled out the historically low U.S. personal saving rate as a drag on economic recovery, and even the cause of such a deep recession. For instance, in an thought-provoking article Cynamon and Fazzari (2008) point to changing consumption norms in the U.S. society since the early 1980s and view declining saving rate both as a source of growth and risk of collapse. Figure 1 shows that what is coined as a “saving slump” (Lusardi, 2009) started in the early 1980s and has continued unabated until the recent recession.

The causes of the declining saving rate (or rising consumption–income ratio) in the United States have been debated since at least the early 1990s. This literature has considered four major explanations for the rising consumption–income ratio in the United States:<sup>1</sup>

1. Demographic transition and cohort effects, whereby as the U.S. population has aged over time, the fraction of the population with higher propensities to consume has increased, leading to a rise in the aggregate consumption–income ratio;
2. Financial innovations, whereby the combination of rapid innovation and deregulation in the financial sector has allowed households to borrow against their human wealth, facilitated annuitization of non-human wealth, and consequently reduced precautionary savings, leading to a rise in the aggregate consumption–income ratio;
3. Capital gains, whereby households have perceived the capital gains in booming stock and housing markets recorded since the mid-1990s as *permanent* (which is the component of changes in wealth that matters the most for consumption decisions), and this wealth effect has culminated in a higher consumption–income ratio; and
4. Low interest rates, which stimulated consumption through the intertemporal substitution substitution channel, leading to a rise in consumption–income ratio.

Independent contributions of each these channels to the rising consumption–income ratio in the United States channels have been extensively studied in the literature, which is surveyed by Bosworth, Burtless, and Sabelhaus (1991), Parker (2000), and İřcan (2010). Overall, there is mixed and weak evidence on the quantitative significance of each of the above sources in accounting for the rise in the consumption–income ratio in the United States. The concluding remarks by Bosworth et al. (1991, p. 224) reflect the general sentiment in this literature:

[our] result suggests that the decline in saving must involve one or more factors that affect the vast majority of households uniformly. In seeking an explanation for the drop in saving, we are

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<sup>1</sup>Here consumption is defined as the personal consumption expenditures, and income is defined as gross national income, as defined in national income and product accounts (NIPA). Figure 1 shows the personal *saving rate* calculated using the Federal Reserve’s Flow of Funds Accounts (FFA), as well as the NIPA-based saving rate, and both show similar long-term trends. Also, regardless of the precise treatment of the foreign and government sectors, non-market consumption (such as imputed rent), and durable goods, there is a marked increase in the actual consumption–income ratio since the early 1980s. So, the differences across business, foreign, government, and personal savings are not driving the trend in the U.S. saving rate.

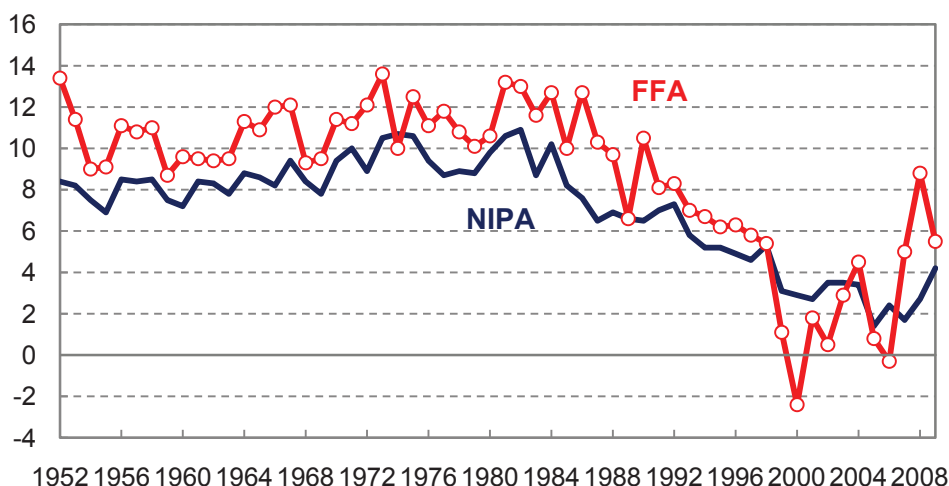


Figure 1: Personal saving rate, U.S. (1952–2009)

Source: U.S. Department of Commerce, Bureau of Economic Analysis, <http://www.bea.org>.

Notes: This figure reports the personal saving rate computed as saving to disposable personal income ratio in percent. There are two alternative measures of personal saving, computed from national income and product accounts (NIPA), and flow of funds accounts (FFA).

thus drawn back to macroeconomic factors, rather than the demographic and microeconomic determinants that many economists currently find so attractive.

In this paper, I consider the possibility that the worsening of the income distribution in the United States since the 1970s may be a factor contributing to the rising consumption–income ratio since the 1980s until the recent economic crisis.<sup>2</sup> In particular, after reviewing the relevant aspects of the literature on the income and wealth inequality in the United States, I suggest several mechanisms through which changes in income and wealth distribution and the consumption–income ratio may be related, and provide tentative answers to whether these mechanisms may in part account for the rising consumption–income ratio in the United States.

## 1 Facts

There are several facts concerning the income and wealth distributions in the United States that form the basis of my arguments.

1. *Earnings inequality.* The Current Population surveys show that all measures of individual earnings inequality have increased substantially since the late 1970s (Katz and Autor, 1999).
2. *Income instability.* The Panel Study of Income Dynamics data show that individual earnings and income instability (the variance of transitory log earnings) have increased steeply from the mid-

<sup>2</sup>To my knowledge, a possible link between the consumption–income ratio and income inequality was first raised by Korty (2008) in the context of the recent increase in the consumption–income ratio in the United States.

1970s until late 1980s, stabilized until late 1990s, and may be rising again (Gottschalk and Moffitt, 2009).

3. *Earnings mobility.* The Social Security individual earnings data show that short-term earnings mobility measures have remained stable over time, and virtually all of the increase in the variance in annual (log) earnings since 1970 is due to increase in the variance of permanent earnings (Kopczuk, Saez, and Song, 2010).
4. *Income polarization.* The income tax returns show that the income share of the top 1 percent increased sharply from 1980 to 2000 (Piketty and Saez, 2003).
5. *Wealth inequality.* The Survey of Consumer Finances data show that wealth inequality, after rising sharply between 1983 and 1989, remained virtually unchanged from 1989 to 2001 (Wolff, 2006).
6. *Consumption inequality.* The Consumer Expenditure surveys show that consumption inequality measured by the variance in annual (log) consumption has increased between 1980 and 1995—although not as steeply as the earnings inequality, and has remained stable from 1995 to 2003 (Krueger and Perri, 2006).

The broader question is then whether these trends are related to the rising consumption–income ratio in the United States from 1980 until mid-2000s in a causal way. The change of trends in earnings and income inequality, wealth inequality, and consumption–income ratio coincide. However, association does not mean causality, and it would be useful to formulate testable hypotheses that would link these trends by causal arguments. While the final wording of these hypotheses may change over time, they will likely fall into one of two distinct categories: (i) The increase in earnings inequality since the late 1970s is responsible for the rising consumption–income ratio in the United States, or (ii) there are common factors driving both the rising earnings inequality and consumption–income ratio in the United States.

In this paper, I will put forward four hypotheses that link the facts listed above with a rising consumption–income ratio. Hypotheses 1 and 4 below fall into the first category of explanations (rising inequality causes rising consumption–income ratio), whereas hypotheses 2 and 3 fall into the second category (a common factor accounts for rising inequality and consumption–income ratio). After reviewing these hypotheses, I will argue that while we may not yet have a framework that accounts for all these facts, there are several ideas that are likely to be part of *any* satisfactory explanation that may emerge in the future. In an attempt to streamline the exposition, much of the discussion below abstracts from changes in income and productivity growth.<sup>3</sup>

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<sup>3</sup>İşcan (2010) considers a purely productivity-based explanation for the rising consumption–income ratio in the United States. In an optimal growth model, variations in current and anticipated future productivity growth rates have considerable influence on the saving rate. For instance, a slowdown in future productivity may lead to higher saving rate today. While such a productivity-based explanation of the consumption–income ratio accounts for several aspects of the data, it is not an entirely satisfactory explanation of the persistently high U.S. consumption–income ratio in the 2000s. Moreover, a representative agent model rules out possibly interesting interactions between inequality and the consumption–income ratio.

## 2 Hypotheses

**1. Can rising inequality and differential saving propensities explain a rising consumption–income ratio?** One classical theme that has been explored extensively in economics is whether saving rates differ significantly across income and wealth groups (Bertola, Foellmi, and Zweimüller, 2006). Here the fundamental hypothesis is that income-rich and asset-rich have a higher saving rate (or, put differently, the consumption function is concave in earnings and non-human wealth). In this case, a mean-preserving spread of income and wealth across households leads to *lower* average consumption, and thus a lower consumption–income ratio. But, despite rising earnings and wealth inequality (Facts 1 and 5), the consumption–income ratio increased, not decreased, in the United States.

One might point out that, while earnings inequality has been rising, after-tax incomes may not be, due to progressive income taxes. However, the progressivity of the federal income tax system in the United States declined significantly during the Reagan presidency in the 1980s and the Bush administration in the early 2000s (Piketty and Saez, 2007). Overall, then, the hypothesis that saving rates differ across income and asset groups is unlikely to account for the rising consumption–income ratio in the United States since about 1980.

**2. Can innovations in financial markets explain rising inequality and a rising consumption–income ratio?** One of the dominant themes in Cynamon and Fazzari (2008) is that the rapid pace of innovation in financial markets over the past 25 years, among other things, decreased borrowing constraints. They argue that while less stringent borrowing constraints might have allowed some households to smooth consumption more effectively, these changes have also endogenously transformed the preferences of other households by allowing them to borrow more. Endogenous transformation of preferences by means of financial market innovation is the genuinely innovative aspect of Cynamon and Fazzari’s analysis. At the same time, an important by-product of financial innovation is the less stringent borrowing constraints faced by asset-poor households in the United States.

How do less stringent borrowing constraints affect inequality and the consumption–income ratio? In standard economic models with convex instantaneous utility functions, the likelihood that households will face borrowing constraints in the future induces them to accumulate “buffer-stock” savings to smooth consumption over time and across uncertain states (see, e.g., Aiyagari, 1994). Buffer-stock savings are costly in terms of foregone consumption. They are especially so for the income- and asset-poor households, because those households have a high marginal utility of consumption. By lifting or reducing borrowing constraints, financial innovation eliminates the need to over-accumulate buffer-stock savings. Consequently, both income-poor and income-rich households tend to reduce their saving (consumption–income ratio rises), and wealth distribution becomes more dispersed. Wealth inequality increases, because the opportunity cost of holding buffer-stock savings by the income- and asset-poor is relatively high. So, these households reduce their savings relatively more.

We thus have a hypothesis that rapid financial innovation simultaneously accounts for the rising wealth

inequality and consumption–income ratio in the United States after 1980. The timing of the events is about right, and the explanation is based on concrete changes in the financial sector that have been extensively documented. Nevertheless, two facts are left unexplained by this hypothesis: (i) the rising earnings inequality which roughly coincided with the wealth inequality (Fact 1), and (ii) despite the fact that wealth inequality reached a plateau by 1989 (Fact 5), the consumption–income ratio continued to rise unabated until mid-2000s.

**3. Can changes in income security explain rising inequality and an increasing consumption–income ratio?** In the United States, social security covers a wide spectrum of risks, and undoubtedly has a considerable impact on consumption–saving decisions of *all* income and asset groups. Over the last 30 years there have been changes to the provision of social security. For instance, the first Clinton administration declared an end to social welfare “as we knew it” with significant implications for access to welfare. Thus, an important question arises: Can a reduction in social security coupled with an increase in income instability (Fact 2) simultaneously account for the rising inequality *and* consumption–income ratio in the United States after 1980?

Mainstream economic models predict that a reduction in income security will lead to higher wealth to income ratios as households respond by increasing precautionary savings through self-insurance. Note that both income-rich and income-poor households should respond in the same direction. Since income- and asset-rich households have relatively lower marginal utility of consumption, the response of savings at the upper end of the wealth distribution tends to be stronger, leading to increased wealth inequality. Overall, while an explanation based on income security can account for rising wealth inequality (Fact 5) in the 1980s and, as argued by Krueger and Perri (2006), can perhaps account for the muted increase in consumption inequality (Fact 6), it would predict a *declining*, not a rising, consumption–income ratio.

**4. Can polarization of incomes explain a rising consumption–income ratio?** Frank (2005) argues that household consumption is increasingly about positional goods, whereby households jostle to position themselves by outconsuming others. This consumption arms-race, according to Frank, leads to escalating consumption relative to income. Moreover, given the polarization of earnings since the 1980s (Fact 4), the norms in this race are increasingly set by the super income-rich. This hypothesis does not explain why inequality might be rising per se, but it would in principle account for the rising consumption–income ratio in the United States.

No doubt, economic implications of this hypothesis are profound. But, at this stage, the possibility that the run-up in the income share of the top 1 percent coincided with a shift in the rest of the U.S. society towards the consumption norms of the super-rich needs further empirical investigation. It is particularly important to know why the consumption–income ratio has responded to the income share of the super-rich, while the rest of the upper end of the income distribution was relatively stable, and whether such a framework could account for the trends about consumption inequality (Fact 6).

### 3 The determinants of inequality

The discussion above suggests that the relation between inequality and saving encompasses a complex set of endogenous variables, and that some of the more promising hypotheses (2 and 4) take trends in income inequality as given. Yet, it is difficult to be definitive about the consequences of changes in income inequality, income stability, and wealth inequality for the consumption–income ratio without being definitive about their driving forces. So, one is tempted to think that there should be a seamless explanation accounting for all these facts.

The literature has considered several explanations. For instance, a large literature in labor economics has examined whether “skill-biased technological change” is responsible for the rising earnings inequality since the 1980s. This hypothesis attributes rising earnings inequality to rising wage premiums for unobserved skills, which lead to permanent differences in earnings. This has implications for macroeconomic analysis, because the relative significance of changes in permanent and transitory components of income are critical for risk-sharing and consumption-smoothing based explanations (e.g., Krueger and Perri, 2006). Yet, despite considerable research on the determinants of income and wealth distributions in the United States, so far there is no consensus view among labor economists (Card and DiNardo, 2002).

There is also a substantial literature in macroeconomics, which uses quantitative general equilibrium modeling to “match” different measures of income and wealth inequality in the United States at a particular point in time. This literature identifies incomplete markets, idiosyncratic risk and social security as essential ingredients of a macroeconomic analysis of inequality (see, e.g., Castañada, Díaz-Giménez, and Ríos-Rull, 2003). However, this literature has so far made no attempt to account for the *rising* inequality and consumption–income ratio in the United States over time. As such, the dynamics of changing inequality are implicitly relegated to changes in the statistical properties of individual income processes—namely, changes in the variance of (log) transitory and permanent earnings.

### 4 An international perspective

Is the simultaneous rise of inequality and the consumption–income ratio in the United States rather unusual from an international perspective? Figure 2 shows that there is also a positive correlation between income inequality and the consumption–income ratio across the OECD countries. Here inequality is measured as mean log deviation, but the same correlation emerges when one uses Gini indexes (and after defining income as after taxes and transfers).

This is not a place to address whether the factors driving the correlation over time in the United States between income inequality and the consumption–income ratio are also at work in these cross section data.<sup>4</sup> However, there is evidence to suggest that the hypothesis of common factors is worth examining. For instance, data from the OECD Income Distribution questionnaire suggest that income

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<sup>4</sup>Unfortunately, for the OECD-30 sample, comparable consumption and income data are too short to simultaneously analyze changes in income inequality and consumption–income ratio over time.

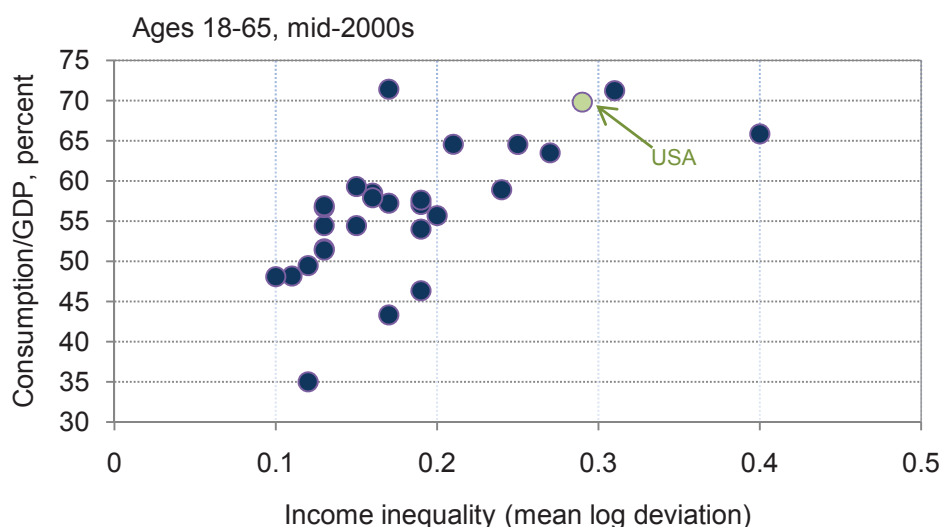


Figure 2: Income inequality and consumption to income ratio, OECD countries

Notes: Consumption is final private consumption expenditures. Both consumption and GDP are quarterly and measured in current local currency prices, seasonally adjusted. Consumption to income ratio in mid-2000s is the average of the consumption to income ratio from 2003Q1 to 2007Q4. Income inequality is mean log deviation of income for the working age population ages 18–65. The sample size is 28 (OECD-30, excluding the Netherlands and New Zealand).

Sources: Income inequality is from OECD Income Distribution questionnaire available at the website <http://stats.oecd.org/Index.aspx?DataSetCode=INEQUALITY>, and consumption and GDP data are from OEDC, *Quarterly National Accounts*, accessed through Datastream.

inequality has generally been rising within the OECD countries. The income share of the top earners in a variety of OECD and non-OECD countries has also increased over the last 25 years as in the United States (Fact 4). Nevertheless, there are some stark differences between English-speaking countries and continental European countries (Atkinson and Piketty, 2007). Whether the increase in income inequality and polarization have also been associated with increased income instability, higher wealth concentration, and increased consumption inequality (albeit more muted than income) in a broader set of countries is an ongoing research question (see, e.g., Krueger et al., 2010). In any case, it does not appear that the United States is an isolated case within the OECD sample. Thus, there is ample reason to think that future research grounded in an international perspective may prove highly fruitful.

## 5 Concluding remarks

I make no claim that the set of hypotheses I have considered here is exhaustive. And, time will tell whether both trends will reverse. Nevertheless, to the extent that both worsening of the income distribution and low saving rates are significant public policy issues, I think it is useful to start thinking about these within a unified framework. It is also unlikely that there is a single factor influencing all the factors listed in this comment. But, identifying these factors will likely inform public policy debate on inequality and savings in capitalist societies. So far, they have often been treated as distinct issues in mainstream macroeconomics.

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