

Great Moderation or Financialization of Volatility? An Integrated Macroeconomic Approach

Jacob Assa¹, 11 October 2018

“To an accountant the idea of a national balance sheet seems a logical corollary of the idea of a national income statement. Economists have had a great deal to say about wealth, but they have only begun to approach the study of wealth via social accounting. We haven't done much towards constructing a national balance sheet” (Copeland 1949:255).

“...models that exclude balance sheets...are prone to ‘Type II errors’ of false negatives, rejecting the possibility of crisis when in reality it is just months ahead.” (Bezemer 2010:676).

1. Introduction

One of the main characteristics of capitalism is its dynamism, captured by Schumpeter’s idea of creative destruction (1950). This enormous potential for innovation and wealth-creation was admired even by a critic such as Marx and Engels (1848). The downside of this dynamism of capitalism is its inherent instability, uncertainty and volatility emphasized by Keynes (1936) and Minsky (1986). However, since the late 1990s, a large literature has emerged claiming that macroeconomic volatility in capitalist economies such as the US has been vanquished by a combination of good luck, good monetary policy and good practices (the Great Moderation, GM below). This is akin to having the Schumpeterian cake and eating it.

At around the same time, an interdisciplinary literature on financialization took off, focusing on the turn to finance in advanced economies. Strands in this literature analyze the rise of shareholder value, the shift from long-term productive investment to short-term investment in financial assets and real-estate, and the increasing importance of finance for households as both consumers and homeowners (van der Zwan 2014). Many of the studies found a negative effect of financialization on growth, employment, inequality etc. (e.g. Stockhammer 2004, Freeman 2010, Assa 2012). Related to this research are several papers which appeared following the global financial crisis, examining the inability of standard economic models to predict the crisis, given their neglect of debt, credit flows and banking in general. By contrast, timely warnings of the crisis were based on ‘accounting models’ (such as stock-flow consistent models) which included balance-sheets (Bezemer 2010).

There is currently no intersection between the GM and financialization literatures, giving the impression that their appearance at the same time was a mere coincidence. The GM literature focuses on volatility but only within the scope of the real economy - i.e. the volatility of output

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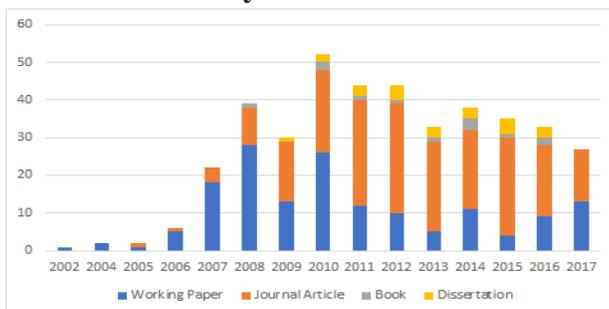
(real GDP), employment and inflation (the latter being ‘real’ in the sense of measuring the rate of change in the prices of *goods and services* rather than financial assets or real-estate). On the other hand, the financialization literature, by definition, goes well beyond real economy variables and examines flows of funds, debt structures and balance sheets, but does not look at macroeconomic *volatility* per se. Even the stock-flow consistent models used to predict the global financial crisis usually focus on trends, levels and *ratios* such as e.g. private debt to GDP, or Godley’s (1999) sectoral balances, rather than on fluctuations around the trend.

This paper aims to fill the gap between these research strands. Section 2 critically reviews the GM literature with a view to identifying various analytical stands taken and their implications for locating volatility within the macroeconomy. Section 3 discusses some basic accounting terms unknown to most economists, and Section 4 proceeds to broaden the view of volatility from the real (cash-only) part of the economy to the integrated macro-economy, including both income (output) accounts and balance-sheets. This broader lens reveals that, while the much smaller ‘real’ economy (the tip of the iceberg) indeed experienced reductions in volatility during the GM period, the much larger balance-sheet aspect of the economy (including variables such as wealth and total debt outstanding) saw sharp increases in fluctuations. Section 5 concludes by examining the implications of an accounting view of volatility for the overall macroeconomic performance as well as for the economic profession, and also outlines ideas for further research.

2. The Great, Cash-only Moderation

The interest in the Great Moderation (GM) - the decreased volatility of real output, inflation and employment in the U.S. (and other advanced economies), usually considered to have started in the mid-1980s - began in the later 1990s and peaked in 2010 (see Figure 1). The number of working papers on the GM peaked in 2008 and 2010, while the number of journal articles peaked somewhat later but still averaged at least 20 per year in the period 2010-2015, even *after* the global financial crisis and the ensuing great recession (events which might have been expected to cast doubt on the notion of a structurally significant macroeconomic stabilization).

Figure 1. Distribution of GM Research by Year and Format



Source: EconLit search (“Great Moderation” in Abstract), 20 March 2018

Beginning with Kim and Nelson (1999), various theoretical explanations supported by increasingly sophisticated econometric analyses have been proposed over the years. Most of the papers accept the great moderation as a fact to be explained and propose causes for it which generally fall into three categories: good luck, good (monetary) policy and good practices such as improved inventory management or enhanced access to finance (Coric 2011).

Prominent works falling within the ‘good luck’ category include Blanchard and Simon (2001), Stock and Watson (2002 and 2003), Ahmed, Levin and Wilson (2004), Primiceri (2005), Sims and Zha (2006), Arias, Hansen and Ohanian (2007), Leduc and Sill (2007), Kim, Morely and Piger (2008), and Canarella, Fang, Miller and Pollard (2010). This body of research is heterogeneous in terms of model specification (VAR vs. DSGE) as well as emphasis (smaller shocks or weaker propagation mechanisms).

By contrast, Clarida, Gali and Gertler (2000) suggested that better monetary policy since the mid-1980s was responsible for the reduction in output and inflation volatility. This logic was further supported by Lubik and Schorfheide (2004), Orphanides (2004), Boivin, and Giannoni (2006) and Bullard and Singh (2008). Once again studies in this vein differ in their details, e.g. some define ‘better’ monetary policy as more active, while others see it as being less aggressive (Orphanides 2004). Perhaps the best-known advocate of the ‘better monetary policy’ explanation is - not surprisingly - Ben Bernanke, former chairman of the U.S. Federal Reserve. He supported this view in his remarks to the meetings of the Eastern Economic Association in Washington, DC, and also enumerated the benefits of decreased macroeconomic volatility:

“Lower volatility of inflation improves market functioning, makes economic planning easier, and reduces the resources devoted to hedging inflation risks. Lower volatility of output tends to imply more stable employment and a reduction in the extent of economic uncertainty confronting households and firms. The reduction in the volatility of output is also closely associated with the fact that recessions have become less frequent and less severe” (Bernanke 2004).

The third line of explanation for the great moderation involves better practices such as improved inventory management, labor market reforms and improved access to external finance. Kahn, McConnell and Perez-Quiros (2002) cite the increased use of information and communication technologies and ‘just-in-time’ inventory management as contributing to lower output volatility. Other papers explain the GM based on improved access to external finance (Morgan, Rime and Strahan 2004, Dynan, Elmendorf and Sichel 2006, Portes 2007, Mertens 2008 and Guerron-Quintana 2009, Grydaki and Bezemer 2013). These papers cite different sources for the improved financial environment, including the rise of multinational corporations with less volatile net worth, the geographic integration of the US banking system across state lines around 1980, and increased financial innovations (which led to an increase in credit flows). Finally, some attribute the great moderation to lower volatility in the growth of work hours and labor productivity, due to ‘just in

time employment' and the increased flexibility of the US labor market (Galí and Gambetti 2009, Stiroh 2009).

All the above works, both before and after the GFC, attempt to explain the causes of this phenomenon. Only a few papers have so far questioned whether it happened at all. Keen (2011) uses Minsky-Goodwin dynamics to create a monetary model where a period of temporary moderation is inevitably followed by its flip-side, a great recession. Keating and Valcarcel (2017) argue that the GM from 1984 onwards is statistically insignificant and pales in comparison to the immediate post-war moderation. Assa (2017) suggests that the GM is a statistical illusion based on changes in treatment of the FIRE sector in national accounts over the years. Crowley and Hughes Hallett (2015) likewise consider the GM to be an illusion and utilize discrete wavelet analysis to show how volatility *shifted* (rather than decreased) from short to long cycles, implying that crises have become less frequent but more severe. Their paper also claims that such volatility shifts are "very difficult to detect with any certainty without a full frequency decomposition of the components of GDP." Lima et. al. (2017) argue for a less structural reason for the GM, suggesting instead that it was based on perception errors made by central banks and the private sector.

Even these critical papers, however, follow the standard GM literature described above by defining macro-volatility narrowly as a real-sector phenomenon, focusing on output (real GDP), employment and inflation². While in some of the papers the *explanans* includes balance sheet variables (e.g. Grydaki and Bezemer 2013), the *explanandum* remains the reduced volatility of real variables. As such, the GM literature only looks at volatility in one part of the economy, and as we show below, the *smaller* part, giving a misleading picture of volatility trends in what is really the full macroeconomy - a combination of the real and financial sectors, including both flows and stocks.

3. Balance Sheet Blind-spot

The 2008-9 financial crisis and the ensuing great recession served as a wake-up call in some quarters of macroeconomics (Keen 2009, Bezemer 2010), and highlighted the problems associated with ignoring financial variables in economic models. While the financialization literature did point out the enormous rise in financial activities and their potential threats to economic and social well-being, this thinking had not penetrated the mainstream. It was only heterodox economists, after all, who saw the crisis coming, mainly since they did look at credit and banks (Galbraith 2009, Bezemer 2010).

More specifically, this awareness to the importance of banking, money and private debt has not yet informed the debate about the GM, even *after* the global financial crisis. The discussion of

² While inflation is often thought of as a monetary variable since it is measured by a price index, it tracks the change in prices of 'real' goods and services, rather than financial assets or real-estate.

macroeconomic volatility has remained squarely within the confines of the ‘real’ economy as defined by GDP, employment and inflation. This is in sharp contrast to business news and reporting which regularly highlight financial volatility, albeit at the level of the firm or stock-market rather than the macroeconomy.

Business and accounting students – unlike many economists – know the importance of looking at both a balance sheet and income statement³. A balance sheet in its simplest form has assets on the left side and liabilities on the right. By convention, equity (or net worth) is recorded as a residual on the liabilities side as well. Since both sides of the balance sheet are equal by definition, this means that $\text{Assets} = \text{Liabilities} + \text{Equity}$, or, rearranged as the net worth formula, $\text{Equity} = \text{Assets} - \text{Liabilities}$.

Table 1. A Basic Balance Sheet

<u>Balance Sheet</u>	
Assets	Liabilities
	Equity (net worth)

Equity is not only what the owners of a firm put into it at the start. It is also a stock measure of income flows coming from the income statement. Figure 2 shows a simple income statement:

Table 2. A Sample Income Statement

<u>Income Statement</u>	
Sales	\$100
Cost of Goods Sold (COGS)	<u>\$75</u>
Gross Profit	<u>\$25</u>
Operating Expenses	<u>\$13</u>
Net Income (or Loss)	\$12

The net income (or net loss if negative) is the ‘bottom line’ CEOs obsess about. It flows into (or out of, if a loss) a firm’s equity line on its balance sheet. Thus, the income statement (like the separate cash-flow statement) show financial flows, while the balance sheet records the stocks of assets and liabilities. They are connected through the equity or net worth line which accumulates the flows of net income. Net worth, however, is also affected by changes in the value of assets, i.e.

³ A third financial statement is the cash-flow statement, which is a separate and focused subset of the income statement.

capital gains and losses. Neither the latter nor changes in assets or liabilities are included in GDP, although changes in the physical stock of inventories *are* included (Assa 2017 shows how this asymmetry makes GDP stock-flow inconsistent).

In macro-accounting, the income statement is GDP. The ‘sales’ line in a business income statement is akin to Gross Output in the national accounts. Cost of goods sold as well as operating expenses are akin to Intermediate Consumption, while net income is the macro equivalent of Value-Added. Perhaps in response to Copeland’s admonishment cited in the epigraph, macroeconomic balance sheets were incorporated into the 1968 revision to the System of National Accounts (the U.N. international standard to which most national systems like the U.S. NIPA conform). Together the national accounts and the balance sheets are known as the integrated macroeconomic accounts (or, misleadingly, the Flow of Funds), published by the Federal Reserve in the US and by Eurostat in Europe.

However, this integration of national accounts and balance-sheets did not affect the near-complete focus of economists and policy-makers on the former (and in particular, GDP), and the two sets of data are often reported separately (e.g. NIPA vs. FoF in the US). Only a few economists used both sources of information before the crisis (and some of them were thus able to predict it), and although there has been a flourishing of stock-flow consistent models in heterodox circles, these have not become mainstream (with the notable exception of the Bank of England, see Burgess et. al. 2016).

One explanation for this resistance to incorporating financial variables and balance sheets in mainstream models could be the dominance of Real Business Cycle (RBC) theory, where fluctuations are seen as caused by ‘real’ rather than financial shocks. The recent debate between Steve Keen and Paul Krugman is indicative of the prevalence of this view, with the latter stating that “[t]he overall level of debt makes no difference to aggregate net worth – one person’s liability is another person’s asset. It follows that the level of debt matters only if the distribution of net worth matters, if highly indebted players face different constraints from players with low debt” (Krugman 2012).

Krugman’s comment relates to *levels* (stocks) of assets and liabilities. They indeed cancel out in the accounting-identity sense, since the overall net worth of the economy (ignoring other countries) must by definition sum to zero. But the behavioral implications of different *rates of change* in holdings of assets and liabilities, or the volatility of such changes, is not necessarily negligible.

It is here that a link to the financialization literature is useful. The crux of the financialization thesis is the existence, since the 1970s of 1980s, of several major shifts in the economic structure of many industrialized (and some developing) countries. One such shift includes the increasing financial activities of non-financial corporations (Arrighi 1994, Krippner 2005, Stockhammer 2004,

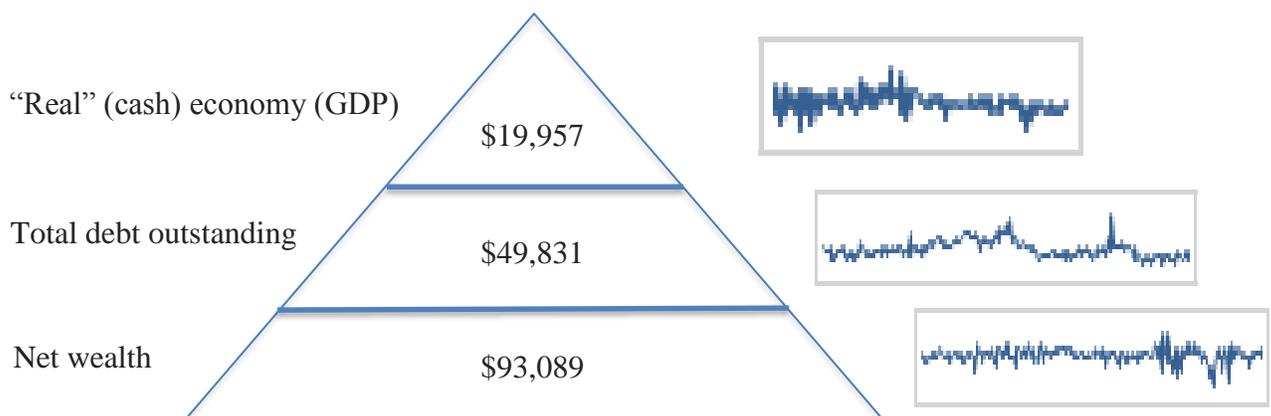
Dumenil and Levy 2005). A second shift, and following from the first, is the changing composition of profits, with a higher ratio coming from financial activities than from production of goods and services. This shift is related to an increase in share buy-backs and dividend payments, as well as more interest payments from non-financial to financial firms (Crotty 2005, Krippner 2005). The third shift concerns the changing composition of bank credit. Bezemer et. al. (2017) show that more than half of the increase in the debt-to-GDP ratio in 14 countries (1990-2011) came from credit to household mortgages and consumer finance, while the share of credit to non-financial firms has been falling for decades.

Given the creative destruction of capitalism and its inherent dynamism as described by Schumpeter, a fourth shift logically follows from the three mentioned above. If volatility is a fundamental feature of investment under uncertainty (animal spirits), and some investment (financed by either retained earnings or credit) has shifted away from productive activities and towards financial assets (with a similar shift in households' consumption patterns, with more debt-financed spending, and more of it on financial assets and housing), one could expect volatility to likewise shift from the production economy (i.e. GDP and its components) to the macro balance-sheet. This is exactly what happened as shown below.

4. The Great Moderation at the Tip of the Iceberg

Before examining volatility trends in the US macro balance-sheet, it is useful to get a measure of the relative magnitudes involved. The RBC view of the economy looks at just real output - the top, narrow layer of the pyramid in Figure 2 below - which amounted to just under \$20 trillion in the first quarter of 2018. The next layer - total debt outstanding - was 2.5 times bigger at nearly \$50 trillion, and the bottom layer - aggregate net wealth in the US - was 4.7 times the size of GDP, at \$93 trillion. Next to the pyramid are sparkline charts showing the evolution of volatility in each layer from 1952 to 2018. The top layer (GDP) indeed shows a great moderation, but the wider Debt and Wealth layers show a sharp *increase* in volatility.

Figure 2. Total income (GDP), debt and wealth (2018:Q1). Billions of US dollars.

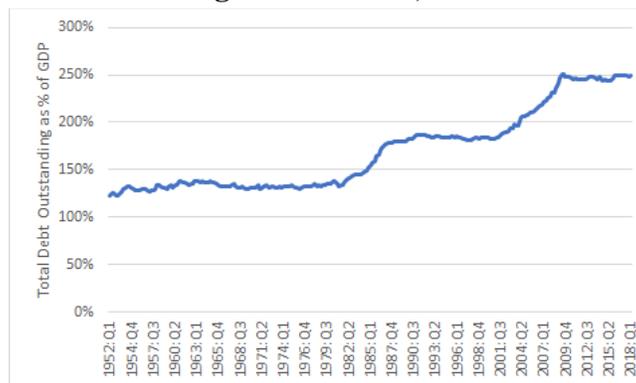


The GM literature focuses solely on trends in the volatility of the smallest component in this figure, the very tip of the iceberg, so to speak. It is true that GDP is a flow measure (of national output and income) while debt and wealth are stock measures. But one of the key components of GDP reviewed in the GM literature is Changes in Inventories, that is, building up or drawing down unsold stocks of finished goods. This item is an adjusting residual which goes up when final sales are less than output and goes down when sales exceed output. GDP thus combines flow variables with changes in stock variables.

In a similar vein, then, we can look at changes to the stock of *assets and liabilities* (i.e. wealth and debt) and their volatility. This approach applies the logic of the GM literature to the entire economy (pyramid) rather than just the ‘real’ bit. It also applies the principles of stock-flow consistent modelling to a literature solely focused on flows without regards to how these affect stocks. That is, instead of just looking at the volatility of income (output) flows, we also look at the volatility of changes in stocks (changes to balance sheet stock variables).

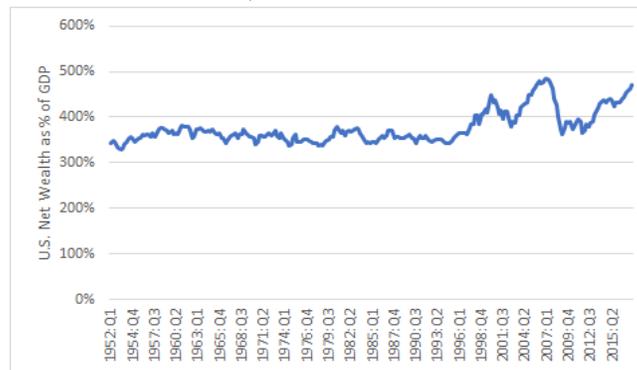
To put the analysis in historical context, Figure 3 shows the evolution of total outstanding debt as ratio of GDP since 1952:

Figure 3: U.S. Total Debt Outstanding as % of GDP, 1952-2018



As mentioned above, total debt was 2.5 times larger than GDP in 2018, up from 1.2 times in 1952. Thus, the relative importance of debt (and thus of its volatility) has more than doubled over this period. Figure 4 shows a similar trend in the ratio of total wealth to GDP. Net wealth in the U.S. increased more slowly than total debt, although from a higher starting point. In 1952 wealth was 343% of GDP, climbing up to 470% in 2017. Debt has also increased more consistently than wealth over this period, with the latter falling by 10.3% in 2001, 6.5% in 2002 28.1% between the third quarter of 2007 and the first quarter of 2009 (outstanding debt, by comparison, only fell 0.2% over the last period).

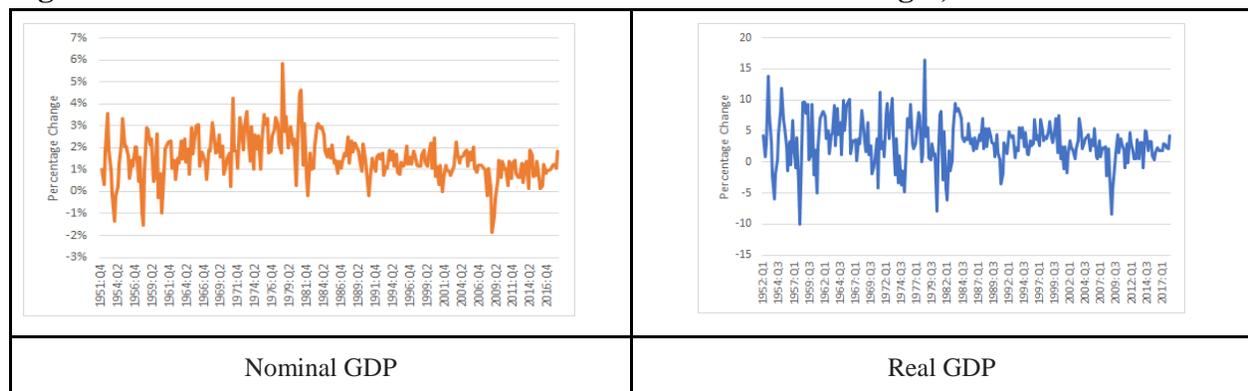
Figure 4: U.S. Net Wealth as % of GDP, 1952-2018



While monetarist and RBC theories consider money to be a veil over the real economy and hence downplay the importance of nominal variables, the reality in modern capitalist economies is that “assets and liabilities are *not* indexed to the rate of inflation” (Keen 2009, emphasis in original). As Keen pointed out, ‘nominal’ variables are real in this sense, and ‘real’ ones are nominal in that they cannot be directly observed but are instead constructed using a price index.

Thus, it is relevant for understanding economy-wide fluctuations to examine the volatility of such nominal variables as net wealth and outstanding debt (both in aggregate and their components). The Great Moderation literature has converged on the year 1984 as the watershed after which volatility of real output has decreased. Figure 5 shows the growth rates of both nominal and real GDP for the data available between 1952:Q1 and 2018:Q1.

Figure 5: The Great Moderation in Nominal and Real GDP Changes, 1952-2018



The figure above shows the usual GM story. The standard deviation of nominal GDP growth fell from 1.2% between 1952 and 1983 period to 0.5% during 1984-2006, with a similar reduction for real GDP volatility from 4.6% to 2.1% over the same period.

By contrast, the volatility of changes in net wealth in the U.S. has actually *increased* by more than half, from an already higher 1.6% in the first period to 2.3% in the second as shown in Figure 6

below. However, rather than 1984, a Wald test reveals the year of structural break to be 1981. The standard deviation of wealth was 1.6% between 1952 and 1980 but increased by nearly a third to 2.2% during 1981-2006.

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Test for a structural break: Unknown break date

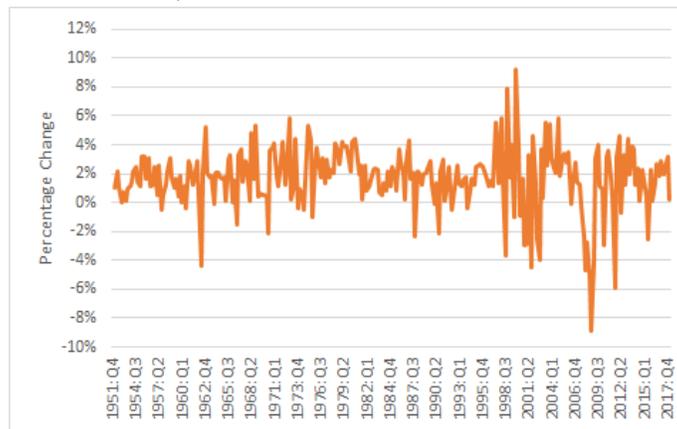
Number of obs =      220

Full sample:      1952q1 - 2006q4
Trimmed sample:  1960q2 - 1998q4
Estimated break date: 1981q1
Ho: No structural break

Test      Statistic      p-value
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swald      25.5241      0.0001

Exogenous variables:      L.NW
Coefficients included in test: L.NW _cons
    
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Figure 6: Changes in Net Wealth, 1952-2018



A more detailed examination reveals that changes in the equity of non-financial corporations have become much more volatile, with a rise in standard deviation from 8.3% to 8.8%, while the volatility of financial corporate equity fell from 9.8% to 9.2%. As the former is nearly three times larger (\$26.5 trillion vs. \$9.7 trillion in the first quarter of 2018), the overall effect was an increase in net wealth volatility. The volatility of households’ net worth⁴ also increased, from 1.5% to 1.8%.

⁴ The first column, net wealth, measures the value of tangible assets owned by non-corporations plus market value of corporations. Households net worth is the total financial net worth of households and was 8% larger than US net wealth in the first quarter of 2018.

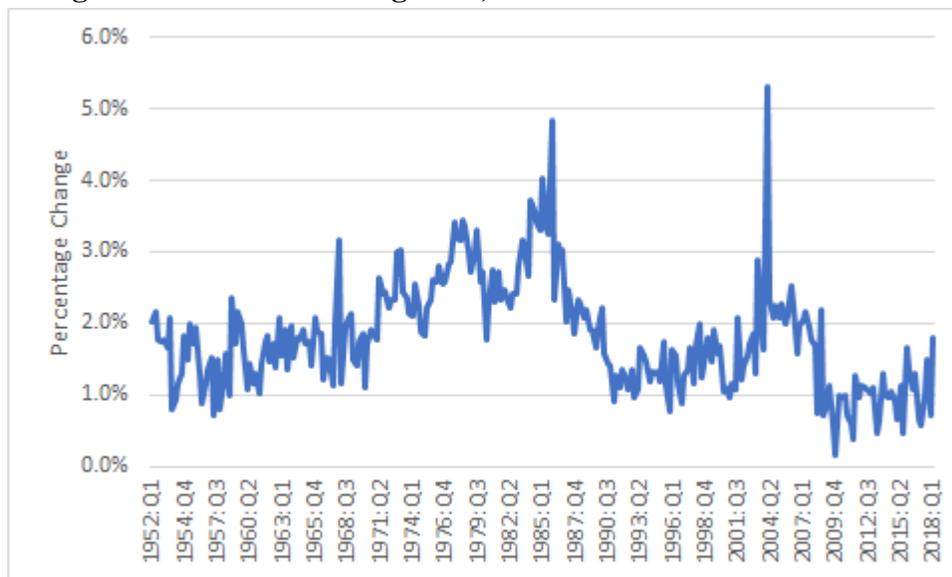
Table 3: Volatility Breakdown in U.S. Net Wealth

	Total	Nonfinancial corporate equity	Financial corporate equity	Households net worth
1952-1980	1.6%	8.3%	9.8%	1.5%
1981-2006	2.2%	8.8%	9.2%	1.8%
Percentage Change	31.1%	5.8%	-5.8%	18.3%

Source: Flow of Funds Table B.1

Turning from wealth to debt, a similar picture emerges in terms of both increased aggregate volatility as well as a shift of volatility away from financial corporations and towards non-financial corporations (although debt volatility is in general lower than that of wealth).

Figure 7: Changes in Total Outstanding Debt, 1952-2018



Here the year 1987 seems to be the inflection point after which volatility increases as shown in the test for structural break below:

Test for a structural break: Unknown break date

Number of obs = 220

Full sample: 1952q1 - 2006q4

Trimmed sample: 1960q2 - 1998q4

Estimated break date: 1987q1

Ho: No structural break

Test	Statistic	p-value
swald	118.3839	0.0000

Exogenous variables: L.Debt

Coefficients included in test: L.Debt _cons

The overall standard deviation for total debt growth declined slightly from was 0.7% between 1952-1986 to 0.6% during 1987-2006, and also fell for households' debt. The most striking contrast in Table 4, however, is an increase of more than 30% in the volatility of non-financial business debt compared to the volatility of financial business debt, which more than halved (a 73% decrease) from 3.7% before 1987 to 1% between 1987 and 2006.

Table 4: Volatility Breakdown in Outstanding Debt by Sector

Flow of Funds Table: D.3 Debt Outstanding by Sector							
<u>Domestic nonfinancial sectors</u>							
	<u>Total</u>	<u>HH Mortgage Debt</u>	<u>HH Consumer Debt</u>	<u>Non-Financial Business</u>	<u>Federal government</u>	<u>State and local government</u>	<u>Financial</u>
1952-1986	0.7%	1.0%	1.5%	0.7%	1.7%	1.6%	3.7%
1987-2006	0.6%	0.8%	1.1%	1.0%	1.3%	5.5%	1%
Percentage Change	-18%	-16%	-27%	30%	-25%	241%	-73%

Source: Flow of Funds Table: D.3

Overall, then, the integrated macroeconomic accounts reveal two volatility shifts occurring during the financialization era. First, a shift of volatility from the macroeconomic income statement (GDP) to the macro balance sheet (changes in overall wealth volatility). Second, *within* the balance sheet, a shift of volatility away from financial corporations and onto non-financial corporations (as well as households in the case of wealth).

Unlike Crowley and Hallett's (2015) analysis of a volatility shift from the short-term to the long-term (analyzed only within the real economy), the shifts from the macroeconomic income

statement to the balance sheet and within the latter are easy to see directly *in the data* (by simply looking at the standard deviation of changes in debt and wealth), without complicated econometrics (which are a hallmark of most of the GM literature).

Our findings are consistent with the historically pertinent nature of capitalism as one of creative destruction, where business cycles may change in form or sector but cannot disappear (like energy). This shift can be understood against the background of financialization. As firms shifted investment from real production activities to financial and real-estate assets, the locus of risk and uncertainty - which are at the heart of the creative destruction of capitalism - likewise moved along from the real to the financial side. Households similarly relied increasingly on credit flows due to stagnating real wages.

The results are also contrary to the what proponents of financial deregulation claim to be the sector's *raison d'être*, i.e. taking on, managing and reducing the risk for the real economy. The same logic has been used to justify astronomical salaries for hedge-fund managers and exorbitant financial fees (which show up as the value-added of the FIRE sector in GDP, see Assa 2016). Looking just at the volatility of GDP and its components (i.e. the cash-economy) would give the opposite picture - reduced volatility in manufacturing and increased volatility in the FIRE sector of GDP (Carvalho and Gabaix 2013). That is due to the fact that only the *footprint* of the FIRE sector is captured in GDP (its net revenues) rather than the actual changes of assets and liabilities which are much larger, as the pyramid illustration above shows.

Therefore, it is not surprising that volatility has gone down for output (i.e. flows of goods and services) but went up in the balance sheet (changes in assets and liabilities). What is surprising is the entire economics profession labeling this period 'the Great Moderation', based on a narrow focus on the 'real' economy (output, employment, and inflation) and near complete neglect of balance sheets. As it turns out, the latter dwarf the former, so a moderation in the real economy pales in comparison to the heightened volatility on the financial side. In short, the literature on the great moderation is based on an accounting oversight (or omitted variable bias).

5. What have we learned?

In their painstakingly researched book *This Time Is Different: Eight Centuries of Financial Folly*, Reinhart and Rogoff (2009) conclude with a chapter called "What have we learned?". Reviewing their major findings, the authors summarize the most prominent early warning indicators for banking and currency crises, ordering them from best to worst. Strikingly, not a single indicator of those listed is a balance-sheet variable. The early-warning indicators considered best for predicting banking crises in that list are the real exchange rate, real housing prices, short-term capital inflows as a % of GDP, current account balance as a % of investment, and real stock prices.

By contrast, our analysis above showcases the existence of a great *immoderation* of volatility in assets and liabilities alongside a moderation of fluctuations in real output, employment and inflation, a finding which casts doubt on the confidence expressed by the GM's proponents. Looking back at Bernanke's list of benefits from greater stability (in the real sector) cited above, moderation of inflation volatility is considered as responsible for improving market functioning and economic planning, as well as reducing resources diverted towards hedging for inflation risk. Moderation of output volatility implies greater employment stability and reduced economic uncertainty for firms and households.

It is harder to separate price and volume movements in the aggregate macroeconomic balance-sheet (though it is possible for individual assets such as real-estate using a housing index). In examining the reduced volatility of balance-sheets as they exist in nominal terms, we are looking at the combined volatility of values rather than that of prices or volumes separately. The mirror image of Bernanke's list, in the case of higher balance-sheet volatility, then, would include a worsening of the functioning of financial markets, making financial planning harder, and increasing the resources needed to hedge against equity losses.

Furthermore, higher debt and wealth volatility imply less stable employment, although this is not a direct consequence given the low elasticity of employment in the FIRE sector (Assa 2016). Instead, this would work indirectly through a wealth effect on non-financial firms which may be hesitant to hire workers given the unstable value of their equity. Increased economic uncertainty facing households and firms would likewise lead to a fall in aggregate demand. Stockhammer (2004) pointed to the connection between financialization (the increase in the proportion of financial to non-financial activities) and a slowdown in (real) accumulation based on a trade-off between short-term profitability and long-term growth. It is also possible that the increased volatility in the balance-sheets of households and firms would outweigh the reduction in fluctuations in their income streams, in which case consumers would spend less and firms invest less.

Another benefit of the Great Moderation mentioned by Bernanke was that it made recessions less frequent *and less severe*. The Great Recession - the worst downturn since the Great Depression - proved the second point wrong, as echoed by Crowley and Hughes Hallett's (2015) finding that recessions are now less frequent but *more severe*. And since output fluctuations have consistently received more attention in macroeconomics than balance-sheet fluctuations (though not in the business press), the build-up of volatility in the balance-sheet remains less visible and hence more dangerous.

An additional lesson to be drawn here is that financial innovation and deregulation do not truly reduce macroeconomic volatility as some of the papers cited above suggest, but merely move it around from the income (output) side of the economy to its balance-sheet, and from financial to

non-financial firms. Rather than disappearing, the instability inherent in capitalism has changed along with it, from one centered on industrial business cycles to volatility of *credit-based cycles*. Thus, the absence of credit and debt analysis from the GM literature has created the illusion of macroeconomic calm, analogous to the confidence inspired by economic models before the crisis, also based on ignoring financial variables.

If changes in assets and liabilities do not cancel out as Krugman (2012) claimed they did, the financial system is not neutral vis-a-vis the 'real' economy (nor does the former truly serve to reduce the latter's risk - if anything it can be said to increase it). This implies enhanced caution regarding the idea of an unfettered, unregulated financial sector left to its own devices in the name of diversifying risk and allocating credit properly.

It also suggests greater humility on the part of economists and the need for economic departments to offer mandatory basic courses or modules in both micro (business) and macro (national) accounting. An article in the Journal of Economic Education shows the opposite view, encouraging accounting students to take classes in economic theory (Kida and Hicks 1982). The problem is that most economists have always been more comfortable with equilibrium models than with accounting, a situation which may need to change given that the crisis was only seen by economists using *accounting models* (Bezemer 2010). National accounting has last been taught at the New School for Social Research in the 1950s (Assa 2016), and today it is almost exclusively offered as a non-academic course taught to government officials by the IMF, World Bank, the OECD etc. An encouraging sign in a related direction is the introduction this year of a graduate-level course in stock-flow consistent modelling (also at the New School). However, in order to ensure that all economists understand the importance of accounting (both micro and macro) to their profession, teaching the basics of these two disciplines in *required* core macro classes would go even further.

This paper presented an initial analysis of integrated macroeconomic volatility in the United States. The clear and novel findings are 1) volatility shifted from the income statement of the economy (GDP) to its balance-sheet; and 2) within the latter, volatility shifted away from financial corporations' equity and towards that of non-financial firms and households' net worth. Much more research is necessary to deepen our knowledge of such shifts. First, a similar analysis should be carried out for other countries, especially where financialization and a moderation of output volatility both occurred (e.g. the UK). Second, detailed analysis of balance-sheet volatility should be carried out using econometric techniques to formally identify the relevant structural breaks in the relevant data series (e.g. sub-components of wealth and debt), which appear from a visual inspection to be somewhat different than the 1984 breakpoint identified in the literature for output growth moderation (1987 for debt and 1981 for wealth). This would also enable further understanding as to what triggered these changes within the general pattern of financialization.

Last but not least, balance-sheet volatility needs to be monitored regularly alongside that of output and inflation, both by academic economists and by policy-makers. The fact that volatility of real variables such as output, employment and inflation decreased up to 2006 while that of balance-sheet items (such as debt, wealth and net worth) increased may indicate that the latter are better leading indicators than the former.

Looking forward, several papers published *after* the financial crisis are still suggesting that the Great Moderation is alive and well, and that the Great Recession was just a bump on the road (Charles, Darné and Ferrara 2018, Bagliano and Morana 2017, Clark 2009). As usual, these papers only look at real-sector variables. Applying our integrated macroeconomic lens to data for the recent decade, the third row in Table 5 reveals that not all volatility has been relinquished:

Table 5: Standard Deviations for Changes in Output, Debt and Wealth

	Real Output		Total Debt		Net U.S. Wealth	Household Net Worth
1952-1983	1.2%	1952-1986	0.7%	1952-1980	1.6%	1.5%
1984-2006	0.5%	1987-2006	0.6%	1981-2006	2.2%	1.8%
2010-2018	0.4%	2010-2018	0.3%	2010-2018	2.2%	1.7%

The good news is that real output (GDP) fluctuations have indeed continued to decrease in volatility, but at a slower rate than before the crisis. Debt, which historically has had a lower volatility than the other balance sheet variables, has likewise continued its volatility decline since after the crisis.

The bad news, however, is that the volatility of aggregate net wealth is still as high after the crisis as it was before it (and higher than before 1981). And households' net wealth, while slightly less volatile since 2010 than it was between 1984 and 2006, is still less stable than it was before the 1980s. These current facts suggest that, if we have learned anything from the 2008 crisis, it is that we ignore balance-sheets at our peril.

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