

CREDIT, MONEY AND LEVERAGE: WHAT WICKSELL, HAYEK AND FISHER KNEW AND MODERN MACROECONOMICS FORGOT

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I am sorry not to be with you at the conference in Stockholm in person. My subject matter is money and the credit cycle. At the time of the conference, I will be in China, researching issues relating to the credit cycle – highly appropriate given discussion on whether Chinese credit development could be a cause of future financial crises.

But it would also be very appropriate to be with you in Stockholm, because a renowned Swedish economist, Knut Wicksell, raised fundamental issues about the role of credit within an economy, which are highly pertinent as we attempt to understand what went wrong in 2007 to 2008, and the severe post-crisis problems in which we still find ourselves.

Wicksell's key insights into the inherent nature of credit creation were explored and developed by subsequent early and mid-20th century economists. And those insights have become more important as a result of developments in financial structure and financial intensity in the century since Wicksell wrote. But to a significant extent Wicksell's initial insights, and certainly the future exploration of those insights, have been ignored or considered as unimportant by much of modern macro-economic theory, and by the pre-crisis policy orthodoxy of central banks and financial regulators.

In part, therefore, my purpose today is to consider a piece of intellectual history: the strange amnesia of modern macroeconomics. But also to reach some conclusions about the policies needed to avoid a repeat of the 2008 crisis and to secure greater financial stability, in the advanced economies but also in the developing world. In particular I will argue that:

- We need to treat both the credit cycle and the aggregate level of leverage across the economy and by sector as crucial issues of macro-economic importance
- And that we need to constrain and manage that credit cycle through the integrated application of monetary and macro prudential tools in a way which goes beyond current proposals for financial regulatory reform, and beyond the simple addition of “financial stability” as a new objective alongside but separate from monetary (i.e., price) stability.

My lecture builds to that conclusion through six sections:

1. Wicksell’s fundamental insight: credit creates purchasing power
2. A fundamental economic issue: how to ensure adequate, but not excessive, growth in aggregate nominal demand
3. Impacts of credit creation beyond price stability: Hayek, Minsky and Fisher
4. Changes over time: the increasing importance of the financial system , and in particular of credit creation, to macroeconomic dynamics
5. The strange amnesia of modern (and not so modern) macroeconomics
6. Implications: developing a new approach

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1. WICKSELL, CREDIT AND PURCHASING POWER

At the core of Wicksell’s “Interest and Prices” (see Chapter Six: *The Velocity of Circulation of Money*) is a careful analysis of the role of money and purchasing power in an economy with a well-developed bank payment system. [Wicksell 1898] Noting that most transactions, even already by Wicksell’s time, did not involve the transfer of physical coins nor of paper notes, Wicksell makes three essential points:

- First, that even in a world without commercial banks and bank deposit money, the extension of credit between businesses could expand effective purchasing power: a “simple credit economy” thus creates purchasing power beyond a “pure cash economy.”
- Second, that if evidence of credit extended, such as promissory notes, become transferable, these transferable credits became effectively a form of money.

- Third, that once you add the institutions of what he calls “organized credit”, i.e., commercial banks, you have a system which can clearly create credit and matching money, and as a result create purchasing power.

This insight is fundamental. Banks do not, as too many textbooks still suggest, take deposits of existing money from savers and lend it out to borrowers: they create credit and money *ex nihilo* – extending a loan to the borrower and simultaneously crediting the borrower’s money account. (Exhibit 1) That creates, for the borrower and thus for real economy agents in total, a matching liability and asset, producing, at least initially, no increase in real net worth. But because the tenor of the loan is longer than the tenor of the deposit – because there is maturity transformation – an effective increase in nominal spending power has been created.¹

The question which Wicksell therefore poses is whether there are the limits to this creation of additional spending power, or whether a credit based system can create ever more money and spending power and as a result produce harmful inflation. He considers first what constraints will arise from freely chosen bank management decisions. He assumes that banks hold “reserves” of either notes or coins or central bank money, to cover both unpredictable differences between payments in and out within the Giro system, and any dangers of bank runs arising from lack of confidence. The need for such reserves will act as a constraint on new credit and money creation. But he makes three important points about the strictness of these constraints:

- First, that the need for reserves across the whole system will tend to reduce the less that people use physical money (whether coin or paper) for payments. Therefore, if we reached a world in which all payments were always made by bank giro, the banking system as a whole would not appear to need any reserves at all.
- Second, in a brilliant insight Wicksell considers what would occur if the banking system were organised as “one Bank”. The answer, in a system where all payments were giro payments, is that there would be no freely

¹ Paul Krugman has recently argued against the idea that this creation of purchasing power makes banks special, citing the argument which James Tobin set out in his paper “Commercial banks as creators of money”. Tobin argued that there remains a crucial distinction between fiat money (which cannot be destroyed except by governments running fiscal surpluses and withdrawing money from circulation) and deposit money (which having been created through credit extension will only remain in the system if private agents are willing to hold it rather than to pay down debt). Tobin was clearly right to stress that there are important differences between fiat (outside) and deposit (inside) money. But in Section 4 (iii) (text and footnote 17) I argue that the requirement for deposits to be voluntarily held does not undermine the argument that banks’ ability to create credit/money and purchasing power is fundamental to macro-economic dynamics.

arising incentive to hold money reserves at all, since all payments out of one customer's account in the "one Bank", would have to show up as deposits of another customer in the same bank.

- Third, he noted that if the international payment system still involves the movement of fiscal metallic money (e.g., gold) or other constraints on the growth of international credit, credit creation within an individual country might be more constrained than if we were dealing with a closed economy (or with one global economy) in which all payments were or could be bank credit based. Conversely, if ever the international system developed to include extensive use of international credit, those constraints would loosen.

These observations, I will argue later, are highly pertinent to the history of the last hundred years of financial development, suggesting factors which have made the dynamics of credit creation progressively more important even than in Wicksell's time.

But it is Wicksell's fundamental insight which is most important. Banks create credit, money and purchasing power. That fact is fundamental to macro-economic dynamics in any economy with a complex banking (or shadow banking) system: and fundamental to both the 2007 – 2008 financial crisis and the depth of the post crisis recession.

Wicksell, however, did not develop all the implications which follow from this insight. His analysis, while a brilliant step forward, remained limited in two ways:

- First, he assumed, as was largely empirically true at the time, that most or all bank credit is extended to business to support investments either in working capital or in investment projects (i.e. to purchase new real physical capital).
- Second, having identified that banks create purchasing power, Wicksell focused almost exclusively on the potential consequences of this for price stability, developing his thesis that central banks can constrain credit creation and achieve price stability by ensuring that the money rate of interest is in line with what Wicksell labels the "natural" rate of interest (essentially the marginal productivity of capital earned on new investment projects).

Most modern macroeconomics has shared this primary or exclusive focus on price stability; so too did pre- crisis central bank orthodoxy. But in the intervening years, economists such as Hayek, Fisher, Minsky and to a degree Keynes, explored a far wider set of implications.

Those implications are considered in Section 3. First, however, it is useful to step back and consider the different ways in which aggregate nominal demand can be

increased, and the potential advantages but also disadvantages of relying on private credit creation to secure such growth

2. MONEY, CREDIT, AGGREGATE NOMINAL DEMAND

Bank (and non-bank) credit creation can be thought of as one of two possible means to avoid a harmful deficiency in aggregate nominal demand which could arise in a pure metallic money system.² There are advantages to relying on credit creation to achieve this effect, rather than on the alternative, which is government fiat money creation. But it is vital to understand the implications which follow from this choice.

In a pure precious metal money system, without either simple or organized credit, the increase in the money supply would be limited by the flow of new precious metal available for minting. Two related effects might as a result constrain real growth:

- First, if the supply of new precious metal were limited, achieving real output growth in line with potential might require downward flexibility of wages and prices. But such downward flexibility might either be unattainable, or if attainable, might itself have depressive effects.³
- Second, in such a system, an increase in savings can literally take the form of “hoarding” with spending power in some absolute sense removed from the economy. This would increase yet further the downward price flexibility required before equilibrium is restored.⁴

² As both David Graeber [Debt: the first 5000 years] and Felix Martin [Money: The Unauthorised Biography] have pointed out, it is not the case that metallic or other commodity money systems developed first in human history to be followed by credit. In many civilizations, systems of credit accounting and resulting debts predated circulating money. The role which credit (whether in the simple or organised form) can play in supporting nominal demand can nonetheless be understood by first imagining the constraints that would exist in a pure metallic money system.

³ The extent of depressive effects arising from stickiness of prices and wages may reflect the extent to which velocity of circulation of the metallic money could increase. One of the key ways in which the measured velocity (Y/M) can increase however, is if private economic agents themselves create credit (e.g. by extending trade credit), taking us into Wicksell’s “simple credit” case. Felix Martin’s “Money” describes a series of historical examples of the spontaneous creation of non-bank credit to overcome restrictions on the supply of money in its pure fiat or “inside money” form: for instance the emergence of private credit relationships and informal credit clearing systems during the 1970 Irish bank workers strike.

⁴ Two sub- categories of “hoarding” behaviour can be distinguished. The first and most relevant to modern economic history, involves economic agents accumulating metallic money (or paper claims thereto) with the aim of saving economic resources for future use. This can have a depressive effect on the economy through the removal of aggregate nominal demand: but eventually is likely to produce an offsetting increase in future expenditure, as the wealth accumulated appreciates in real value as a consequence of induced downward price effects (Pigou’s wealth effect). The more extreme case, found in earlier societies, involved the permanent withdrawal of metallic money from circulation for inclusion in burial hoards and temple treasuries.

Concerns about the adequacy of nominal demand to support economic growth in line with rising potential, were therefore central to late 19th century policy debates, particularly in the U.S. The monetisation of silver was proposed as a means to supplement apparently inadequate supplies of gold.

Clearly if downward flexibility and wages and prices is compatible with full employment and with real growth in line with potential, no problem arises. But most modern economics has tended to the assumption that at very least price stability, and ideally a low but positive rate of inflation, is optimal. To achieve this, some growth in aggregate nominal demand is required.

Two means can be used to deliver a growth in nominal purchasing power beyond that which would occur given constraints imposed by available sources of precious metal.

- One involves the government/central bank issuing absolute fiat money (unbacked by precious metals) to cover fiscal deficits not funded by the issue of interest bearing debt. And there are instances in economic history when such money finance of fiscal deficits has proved compatible with reasonable price stability, while supporting economic growth. The Pennsylvania commonwealth used such a technique in the 1720s.⁵ The US federal government's issues of pure fiat "greenbacks" during and after the civil war supported growth without excessive inflation. And Japanese finance minister Takahashi used money financed deficits to pull the Japanese economy out of recession in the early 1930s, again without producing harmfully high inflation. But the option of government fiat money creation suffers from two disadvantages:
 - It politicises decisions about the allocation of additional purchasing power – with money potentially allocated to wasteful investment projects, or to the consumption of favoured political constituencies.
 - And it may be difficult, once the option of fiat money finance is first recognized and allowed, to prevent its excessive use. The hyperinflations of Weimar Germany or modern day Zimbabwe illustrate that danger.⁶

On a number of occasions such permanent hoarding does appear to have had macroeconomic effects (see Graeber, 2012).

⁵ See Andrew Jackson and Ben Dyson "Modernising money: why our monetary system is broken and how it can be fixed" (2012), Appendix 1, for a description of the Pennsylvania example.

⁶ The extent to which the Weimar hyperinflation was a consequence of excessive government debt finance has been contested by Michael Kumhof and Jaromir Benes in their recent paper "The Chicago Plan Revisited" (2012). They argue that the primary cause of the hyperinflation was instead the willingness of the Reichsbank

As a result, societies have tended to place strong institutional barriers against overt money financing of fiscal deficits. And the use of this option has most commonly been associated not with overcoming problems of deficient demand, but as a means to finance wartime expenditures in political contexts which make it difficult to raise sufficient resources via taxation or the issue of interest bearing debt.

- The alternative route to adequate nominal demand growth is through the extension of bank (or other) credit and the creation of matching money or money equivalents. Such a system, as Wicksell identified, creates purchasing power. And in such a system increased savings will not, if the savings are still held as financial securities or bank money, have the same depressive effect as the pure “hoarding” of metallic money. The development of commercial banking systems in the 19th century may therefore have played an important role in enabling a faster growth in nominal GDP than would otherwise have been possible. And this may in turn have enabled faster growth in real GDP, in line with growing real potential. Some contemporaries certainly thought so:
 - Walter Bagehot, in the “Introductory” chapter to Lombard Street, argued that *“much more cash exists out of banks in France and Germany and in all the non-banking countries, than can be found in England or Scotland, where banking has developed ... but the cash is not, so to speak ‘money market’ money: it is not obtainable.”* [Bagehot, 1873] As a result, Bagehot suggested the French money could be “hoarded” and become effectively “useless”, while *“the English money is ‘borrowable’ money”*.
 - And Harold Moulton, the Chicago economist, argued in 1919 that the U.S. could not have achieved its remarkable late 19th century growth without a growing commercial banking system able to support faster growth in spending power than would have been possible in an economy constrained by precious metal money sources [Moulton, 1919]

Bank (and other) credit and money creation can therefore be seen as an alternative means to ensure adequate nominal demand growth. And compared with government fiat money creation, it can have two important advantages:

to provide limitless finance (via bill discounting) to private sector banks and thus the real private economy (in an illustration of the fact that the pursuit without limit of the “real bills” doctrine can in fact be limitlessly inflationary). In fact the classic but still best account of the hyperinflation, Constantino Bresciani- Tourani’s “The Economics of Inflation” (1931) suggests a two phase process in which (i) monetary finance of fiscal deficits and war debt repayments was the initial motive force of the take-off of inflation to very high levels (ii) The inflationary impetus was then subsequently magnified by the Reichsbank support for private credit creation on which Kumhof and Benes focus.

- It avoids the danger that fiat money creation could be pursued to excess.
- And it may avoid the politicised allocation of new purchasing power, instead allocating additional purchasing power according to market principles. It may therefore be a superior means for ensuring that resources are placed in the hands of entrepreneurs/businesses capable of using them to best effect.

But these potential advantages will not apply if bank credit creation can itself be excessive, or if banks themselves sometimes allocate additional purchasing power in sub-optimal ways.

And bank credit creation, unlike government fiat money creation, entails not just the creation of new money and purchasing power, but also the creation of ongoing debt contracts, which themselves can have macroeconomic consequences.

As a result, bank and other credit creation can, unless appropriately constrained, create the instability and misallocation effects described by, among others, Hayek, Minsky and Fisher.

3. IMPACTS BEYOND PRICE STABILITY: HAYEK, MINSKY AND FISHER

Banks create credit, money and purchasing power: it therefore matters to whom and for what purposes credit is extended. And credit extension, whether by banks or directly from savers to borrowers, creates ongoing debt contracts: it therefore matters how large these debt contracts are relative to GDP.

As a result, credit creation cycles have important effects which go beyond the potential impact on price stability on which Wicksell focused. These effects can usefully be categorised under three headings⁷:

- Hayekian real investment effects and cycles

⁷ A further important implication of credit and debt-creation not considered here is its impact on wealth inequalities. At least three specific effects can be identified: (i) The creation of extreme wealth: because credit and associated purchasing power are allocated to specific agents, superior access to favourably priced credit can be a crucial driver of great wealth accumulation: the key reason why some Russian oligarchs became so rich was their superior access to credit (sometimes from banks which they owned or controlled) during the period of state asset privatisation. (ii) Rising inequality as a result of property price appreciation: because credit extension can drive sustained asset price appreciation (e.g. in the UK residential real estate) favourable access to credit has in some societies been crucial to wealth accumulation over the last several decades: small differences in initial endowments, whether in the form of money to finance deposits or of high income at a crucial early career stage, can as a result have very large effects on eventual wealth distribution. (iii) Debt accentuated poverty traps. Conversely, the use of credit by less creditworthy customers at high rates of interest, whether to bring forward consumption or in an attempt to share in the benefits of rising house prices, can be a major self-reinforcing driver of inequality at the low end of the distribution. The sub-prime mortgage boom and subsequent bust in the U.S. has further intensified U.S. wealth inequalities.

- Minsky style credit and asset price cycles
- Debt rigidities and debt deflation effects of the sort described by Irving Fisher and Henry Simons

Writing amid the wreckage of the Great Depression, indeed, Fisher and Simons concluded that these factors combined made bank credit creation so potentially dangerous, that it should be outlawed, with any appropriate nominal demand growth instead achieved by government fiat money creation.

(i) Real investment effects and cycles: Hayek

Wicksell assumed that credit is largely extended to one particular category of borrower: to businesses/ “entrepreneurs” to fund investment. Schumpeter and Hayek made the same assumption. From that assumption, two consequences follow: one potentially positive for economic growth; the other potentially negative for economic stability.

Investment, if the economy is already operating full capacity, is at the expense of consumption, and amounts to what Hayek and others labelled “forced savings”: *“an increase in capital creation at the cost of consumption, through the granting of additional credit, without voluntary action on the part of the individuals who forego their consumption, and without them deriving any immediate benefit”* [Hayek 1929]. This forced or induced saving and investment, can in turn drive a higher rate of GDP growth than would otherwise be achieved.

The empirical support for this proposition appears clear, and relevant not only to the 19th or early 20th century economies, but to post war and more recent development processes⁸. As Joe Studwell describes in *“How Asia Works”*, the successful post-war development models of Japan and Korea relied on high levels of capital investment achieved through bank credit creation skewed towards business and in particular towards heavy industry. [Studwell, 2012] And in modern China, it is clear that banking system credit creation and allocation, primarily from the state owned banks to state owned enterprises and to local governments to fund infrastructure investment has driven an extremely high investment rate, which has helped drive rapid growth.

⁸ The idea that banking systems may have played a crucial role in driving industrial catch up was proposed by Alexander Gerschenkron *“Economic Backwardness in Historical Perspective”* (1962) in respect to German industrialisation in the late 19th century. Gerschenkron’s primary focus however was on the perceived advantages of banks (relative to equity markets) in respect to screening, monitoring and governance, rather than on the creation of credit and purchasing power per se.

But the mention of China also immediately suggests a potential negative factor as well – the danger that a skew towards investment might drive over investment in low return projects, and result in a macro-economic imbalance, a level of investment incompatible with respect to future consumption, and therefore only maintained by a continually increasing flow of new credit.

And while it can be argued that the danger of a Chinese over investment cycles derives in part from the political character of the credit allocation process, in particular by the state owned banks, the pre-crisis construction booms experienced by Ireland and Spain illustrates that over-investment can also occur in systems where credit allocation is driven by private market considerations.

As Hayek set out in *“The Monetary Theory of the Trade Cycle”*, bank credit creation and the investment cycles that it funds can be a major cause of economic volatility. Hayek himself, ever wary of the belief that governments could offset the imperfections of market mechanisms without introducing still more serious imbalances, also argued that there was little we can do about such cycles: the negative impact of increased volatility was to Hayek the unavoidable concomitant of the positive impact of a higher investment rate. *“So long as we make use of bank credit as a means of fostering economic development”*, Hayek concluded *“we shall have to put up with the resulting trade cycles. They are in a sense, the price we pay for a speed of development exceeding that which people would voluntarily make possible through their savings, and which therefore has to be extracted from them.”*

While paying credit both to Wicksell and to his own Austrian school mentor Ludwig von Mises for having correctly identified the centrality of bank created purchasing power, Hayek therefore criticised both for their subsequent focus solely or primarily on “the general value of money”. *“All these theories, indeed, are based on the idea – quite groundless but hitherto virtually unchallenged – that if only the value of money does not change, it ceases to exert a direct and significant influence on the economic system”*.

(ii) Existing assets, speculation and asset price cycles: Minsky

Hayek correctly identified that bank credit creation processes can skew the economy towards investment, or indeed towards specific categories of investment, with both potentially beneficial and potentially harmful consequences. The danger of potentially harmful consequences becomes still more apparent when we consider the full range of purposes to which credit creation can be devoted and the way in which asset prices and apparent net worth can be endogenously driven by credit creation in self-reinforcing cycles.

Like Wicksell and indeed Schumpeter, Hayek assumes that banks extend credit primarily to entrepreneurs/businesses to fund the purchase of capital assets and new business projects. So too indeed do most modern economics textbooks and

academic articles. But in fact credit extension can take a number of quite different forms, with quite different macro and micro implications.

Thus (Exhibit 2):

- Much credit even if extended to businesses, funds not new investment projects, but already existing assets. Some commercial real estate lending, for instance, supports new physical development, but much also represents the leveraged purchase of already existing buildings. Similarly, acquisition and leveraged buyout finance essentially funds the leveraged purchase of existing business assets (in part to enjoy the advantage of the tax deductibility of debt).
- A majority of bank credit in most systems today, meanwhile, is not extended to businesses at all, but to households, primarily for home mortgages. Some of this credit funds at least indirectly the construction of new houses, which are a form of “investment project”. But much of it, and in many financial systems the majority, funds the purchase of already existing houses, facilitating intergenerational transfer. It would be possible indeed, for there to exist an economy with a stable population, in which there was no new housing construction at all, but which had a very large and growing stock of residential mortgage debt.
- And a significant proportion of bank credit – unsecured personal finance – essentially facilitates life cycle consumption smoothing, enabling less patient households to bring forward consumption ahead of income, or indeed enabling poorer households to fund for a period of time levels of consumption incompatible with their prospective lifetime income.⁹

Some of these non-investment categories of lending can serve socially useful purposes. But they are quite different purposes from the “lending for real investment projects” on which both the early literature and much modern economics tends to focus.

These non-investment categories moreover, are large and have grown far more rapidly over the last 50 years than lending for investment projects. A reasonable estimate might suggest that today no more than 15% of lending by the UK banking

⁹ The use of bank credit to purchase houses, and to fund immediate consumption, can of course be combined, and can have important macroeconomic as well as distributional effects. In his recent book “Faultlines” Raghuram Rajan makes a persuasive case that the subprime mortgage boom in the U.S. had its roots in rising income inequalities, with low income household seeking to use debt financed purchase of homes to supplement inadequate income with asset price appreciation. The large scale extension of mortgage credit to subprime borrowers thus seemed for a time an alternative to more fundamental policies to address inequality.

system is funding the “new investment projects” on which theoretical descriptions of banking systems still tend to concentrate. (Exhibit 3)

Non-investment categories of lending create specific and different risks. In particular lending against already existing assets creates potential drivers of instability beyond those identified by Hayek.

Hayek described cycles of investment and over investment in real new physical capital. But credit extension can drive even stronger cycles in the price of existing assets, and in particular of assets such as land where additional demand cannot induce an offsetting increase in supply. As Hyman Minsky described, the price of existing assets can be exogenously driven by cycles in the provision of credit, as result of the behaviours of, and incentives facing, both borrowers and lenders. In the upswing of the cycle [Minsky, 1986] (Exhibit 4):

- Borrowers make decisions based not on prospective future cash flows resulting from investments, but on the expectation of future price increases.
- While lenders make decisions influenced by both
 - Assessments of borrower credit worthiness which are for a time self-fulfilling, with more lending driving asset price increases which appear to make lending less risky.
 - And by increases in bank, and other intermediary, net worth – with lower loan losses both directly augmenting bank capital and thus lending capacity, and making it easier for banks to issue new equity capital at a higher price.¹⁰

The possibility of such cycles undermines both Wicksell’s focus on price stability alone and his belief that an optimal pace of credit extension can be ensured if the money rate of interest aligns with the natural rate. Thus:

- Credit and asset price bubbles can occur which have no direct effect either on real investment quantities, or on the prices of current output goods and services which enter inflation measures. But these cycles can have important macroeconomic effects through the volatility that they create in the measured net worth of different real economic agents, taking into account both asset price variations and the debt burdens left over by the upswing of the credit cycle. Cycles in credit extension and in the prices of existing assets can thus cause havoc as much as real investment cycles.

¹⁰ As Section 4(ii) below discusses, these net worth effects were further intensified by the hard wiring of the system of secured financing, margin calls and mark to market accounting which developed in the 20 or 30 years running up to the 2008 crisis.

- In the years running up to and after the 2007 to 2008 crisis, Ireland and Spain suffered classic Hayekian real over-investment cycles in the residential housing and commercial real estate sectors, with the construction sectors of the economy swelling beyond a sustainable size.
 - The UK did not experience a construction boom to anything like the same degree. But it did experience a Minsky-style boom in the credit extended against both residential and commercial real estate, and in their prices, with predictable post-crisis consequences.
- And any attempt to control the credit cycle through the use of the interest alone, may prove severely sub optimal, given the very different interest rate elasticity of different categories of credit demand. If commercial real estate investors or developers anticipate future rapid increases in property prices (extrapolating past trends driven by easy credit supply) and make borrowing decisions on this basis (in what Minsky labelled the ‘Speculative’ or ‘Ponzi’ stages of the credit cycle) they will likely prove far less elastic in their response to increased interest rates than investors in real business projects not underpinned by rising property prices. Attempting to slow down a credit boom through interest rates alone may thus cause major harm to the non – property parts of the economy long before it contains the property boom. Conversely, as Raghuram Rajan has recently argued, attempting to re-stimulate a post crisis economy with ultra-low interest rates, may result in *“too many buildings and not enough machines.”* [Rajan, 2013]

(iii) Debt rigidities, and debt deflation effects: Fisher and Simons

Bank credit creation results in additional purchasing power. It can therefore be a useful means to ensure adequate growth in aggregate nominal demand. But bank credit creation also necessarily results in ongoing debt contracts. And debt contracts introduce rigidities and risks not created by equity contracts. A focus on these rigidities led leading economists of the 1930s – such as Irving Fisher and Henry Simons – to conclude that the overall level of leverage in an economy is a crucial macroeconomic variable, and that the crash of 1929, and the subsequent Great Depression, were direct results of excessive leverage growth in the 1920s.

Debt contracts are create different risks from equity contracts. The detailed arguments for that proposition have been made extensively elsewhere¹¹. Here I will outline four essential points:

¹¹ See Adair Turner “Monetary and financial stability: lessons from the crisis and from some old economic texts” (South African Reserve Bank conference, November 2012)

- First, the fact that debt contracts, with their apparently fixed and certain returns, induce a tendency for investors/ lenders to suffer from “local thinking” or myopia, as a result entering into many debt contracts which as Gennoaili, Shleifer and Vishny have put it “owe their very existence to neglected risk.” [Gennoaili, Shleifer and Vishny, 2010]
- Second, the importance of the rigidities and potential disruption introduced by default and bankruptcy processes, which as Ben Bernanke has pointed out “in a complete markets world [...] would never be observed.” [Bernanke, 2014]
- Third, the need for short and medium term debt contracts to be continually rolled over, making continuity of new credit flow a key macroeconomic variable, in a way that the continued flow of new equities issues is not.
- Fourth, the fact that agents’ existing levels of leverage can have implications for marginal decisions on credit demand, consumption or investment, in ways not well captured by standard utility maximising assumptions. Agents who have suffered net worth losses, and who now perceive themselves to be “over leveraged”, may become focussed on the need to pay down existing debt, even if further borrowing to finance a marginal investment project might deliver positive marginal benefits.¹²

These features of debt contracts can create economic stability whether credit is extended to entrepreneurs to finance investment projects or to speculators or consumers to purchase existing assets. And they can apply even when debt contracts arise directly between savers and borrowers, rather than resulting from bank credit and money creation. Henry Simons therefore argued that in an ideal economy there would be no short term debt contracts at all – and by short-term he meant less than 50 years. And in Fisher’s famous description of the process of debt deflation [Fisher, 1933], several of the steps arise simply from over indebtedness, whether the debts arose from bank credit creation or from direct lending. (Exhibit 5)

But bank credit and money creation still further increases these risks. It facilitates debt contract creation and thus makes it more likely that excessively high real economy leverage will be achieved: and it can increase the severity of the deleveraging downswing, as bank net worth constraints drive credit supply restrictions, falling asset prices and real economy effects in a self-reinforcing cycle.

¹² Richard Koo argues persuasively [Koo, 2009] that such “balance sheet recession” effects were crucial to the deflationary bias of the Japanese economy after 1980s credit and property price boom ended in the crash of the early 1990s. The importance of variations in borrower net worth, exacerbated by previously accumulated debt burdens, in explaining fluctuations in demand for credit is one among the micro foundations of macro effects on which, as Section 5 (ii) describes, several modern economists have focused attention.

Simons and Fisher therefore identified banks' ability to create credit and money *ex nihilo* as a particularly pernicious driver of instability.

"In the very nature of the system" Simons argued "banks will flood the economy with money substitutes during booms and precipitate futile attempts at general liquidation thereafter." [Simons, 1936]

In response to this destructive danger, they therefore proposed that bank credit and money creation should be not just constrained but abolished.

(iv) 100% reserve banks and fiat money finance

Their proposal was simple. Fractional reserve banks should not be allowed to exist: all banks which provide payment system money should be required to hold 100% reserves at the central bank. Any loan funding should pass directly from savers to borrowers, without passing through a maturity transforming bank balance sheet. The money supply would be equal to the monetary base: and the process of private credit and money creation, described by Wicksell, would cease to operate.

But if fractional reserve banks and private bank credit creation are outlawed, a potential source of growth in aggregate nominal demand disappears, leaving nominal demand growth dependent either on the vagaries of precious metal supply, or on fiat money creation by the government. The logical corollary of a 100% reserve banking system is therefore the assumption that if nominal demand growth is desirable, governments/central banks should ensure it by running appropriately sized fiscal deficits financed not with interest bearing debt but with central bank money.

Fisher clearly accepted and embraced that logical link, arguing in 1936 for both 100% reserve banking and for money financed deficits [Fisher, 1936]. Simons' preference was for an economy in which wages and prices were so flexible that real growth could be compatible with a quite fixed monetary base/money supply, and with unchanging nominal demand. But he accepted that until and unless such flexibility was achieved, money financed fiscal deficits would be required [Simons 1936]. In 1948, Milton Friedman re-stated the case for both 100% reserve banking and for money financed fiscal deficits [Friedman, 1948].

None of which proves that abolishing fractional reserve banks and accepting the logical corollary of money financed deficits would be socially optimal. The offsetting arguments against fiat money creation and in favour of creating demand through a private bank credit system, outlined in Section 2 above, may also be important.

But what the insights of Simons, Fisher, Minsky and Hayek do clearly illustrate is that the ability of banks to create credit, money and ongoing debt contracts, has important real macro economy implications and creates important instability risks, and can do so even if purchasing power creation does not threaten price stability.¹³

4. CHANGES OVER TIME: THE INCREASING IMPORTANCE OF FINANCIAL FACTORS

¹³ The real economy effects of post crisis recession may of course be accompanied by a threat to price stability in the form of price inflation below target.

The implication of Sections 2 and 3 is that the details of financial intermediation have important macro-economic implications, and in particular that the dynamics of credit and private money creation and aggregate levels of real economy leverage are crucial factors.

There are moreover strong arguments for believing that financial considerations have become steadily more important to macro-economic dynamics over the last 70 years, as a result of developments in advanced economy financial systems. Three sets of developments have been important.

- Levels of leverage have increased, and the balance of different types of credit has changed quite dramatically.
- Financial market developments have tended to remove any naturally arising constraints on the strength of the credit cycle, and in some ways have turbo charged it
- And, as financial intermediation has developed, the liabilities of both banks and other financial institutions have evolved in ways which make it decreasingly possible to understand what is going on by focusing solely or primarily on the transactions demand for money.

(i) Increasing leverage and changing mix of credit categories

The immediate aftermath of the Great Depression and the Second World War saw a dramatic reduction in aggregate private sector deleverage in the U.S. From the 1940s till the eve of 2008 crisis, however, aggregate private sector leverage relentlessly increased (Exhibit 5). A similar growth has occurred in the UK and many other advanced economies.

Equally important has been a changing balance between the different categories of credit extended. The assumption that either all lending (or all bank lending) takes the form of lending from the household sector to businesses to fund investment projects was always an oversimplification. Even in 1964 lending to households by UK Banks and building societies slightly exceeded lending to corporates (Exhibit 6). But it remained true at that time that the household sector was a large net depositor into the banking and building society sector and the corporate sector a significant net borrower. Between then and 2008 major changes occurred:

- Household sector debt soared from 14% to over 90% of GDP and the household sector became a net borrower from the banking/building society sector system. (Exhibit 7)
- Corporate bank debt to GDP also grew dramatically, from 13% to 35% GDP. In addition there was an important shift in the sectoral balance within that total, especially after the 1980s. Lending to commercial real estate (CRE) developers and investors ballooned as a percentage of GDP, while lending to the non CRE

corporate sector is no higher as a percent of GDP than in 1964 (Exhibit 8): the manufacturing sector, indeed, has in some recent years been a net depositor into the UK banking system.

Any assumption that bank intermediated credit creation system is primarily involved with “funding investment projects” is therefore completely unrealistic. In most advanced economies, though to somewhat different degrees, bank lending is strong skewed towards the funding of real estate purchased by households, corporates or institutional investors: in the major country where this is less the case in the formal banking sector (the US) the securitisation/shadow banking system is strongly skewed towards residential mortgages. These credit flows sometimes fund new construction, but often also fund the purchase of already existing assets.

The potential for both Hayekian over investment cycles and Minsky type cycles in existing asset prices has therefore increased as overall leverage has grown. Price stability alone has become an increasingly ineffective measure of potentially important macroeconomic effects.

(ii) Facilitating changes in credit market structure and dynamics

The increases in aggregate leverage described above have been facilitated by, and the potential adverse impact accentuated by, significant changes in the nature of bank (and shadow bank) credit creation systems. These have tended both to remove or reduce the power of naturally arising constraints on the credit cycle, and to hardwire some credit cycle dynamics.

Three sets of changes have greatly reduced the power of the three naturally arising constraints which Wicksell identified and which were described in Section 1. These are:

- The development of deposit insurance and the increasing assumption of retail depositors that all banks are effectively risk free. This largely removes the danger of retail deposit runs, and certainly the danger of deposit money withdrawal into notes and coins (rather than simply the transfer of deposits from one bank to another). It thus brings the system in total closer in behaviour to Wicksell’s “giro payments only” model.
- The increased size and sophistication of interbank markets, which recycle liquidity within the overall banking and wider financial system. These have grown significantly in size relative to total bank balance sheets: whereas in 1960 the majority of banks’ balance sheets related chiefly to real economy depositors and borrowers, now many bank balance sheets are dominated by intra-financial system assets and liabilities. (Exhibit 9) Interbank markets have also developed new mechanisms to reduce risk, particularly through the use

of secured financing mechanisms, such as repo contracts. The net result might not have surprised Wicksell.

- The more an overall banking system creates efficient, low cost and apparently low risk ways to redistribute liquidity, the more that the system in total will act as if it were Wicksell's "one bank". Indeed if all interbank credit extension were perceived to be entirely riskless, a multi-bank system would effectively acts as "one bank" system.¹⁴
 - And in a one bank system, the private incentives for banks to hold ultimate "reserves" of central bank money declines, with banks choosing if permitted to hold their liquidity resources as "inside money" claims on other parts of the system, or in the form of liquidity lines from other parts of the system. Whenever central banks allowed it, holdings of monetary base reserves relentlessly decreased. (Exhibit 10)
- The final removal – with the collapse of the Bretton Woods system – of a role for non-credit based international payments (e.g. gold), and the extensive development of cross-border private credit, bringing the whole advanced world economy closer to Wicksell's unconstrained closed economy model.

In addition, the development of securitisation, of secured funding and lending techniques, and of the multistep chains of credit intermediation covered by the term 'shadow banking', facilitated additional credit creation and introduced systemic features which tended to hardwire and therefore turbo-charge the dynamics of the credit cycle.

- Shadow banking enables the creation of both credit and near-money equivalents through multi-step chains of leveraged maturity transformation outside the formal banking system [see Turner 2012a and FSB 2012].
- And the increasing use, both within the shadow banking system and in parts of the formal banking system, of secured finance, collateralisation techniques, mark-to-market accounting and "value at risk" (VAR) based risk management, has hardwired the links between changes in asset prices and changes in the net worth of intermediaries and contract counterparties. Even

¹⁴ Before the 2007 to 2008 crisis, most interbank lending was indeed perceived to be close to risk free. This perception changed significantly in summer 2007, and then collapsed between September and October 2008, causing a seizure of the Interbank market. Effectively we can think of advanced economy banking systems as switching from a Wicksellian "one bank" to a multiple bank model between 2007 and autumn 2008, with the implications for credit and purchasing power implied by Wicksell's analysis.

in the traditional banking model, changes in intermediary network play a role in the self-reinforcing credit and asset price cycle described in Exhibit 4. But in a world of collateralised contracts and mark-to market accounting, with margin calls driven by movements in asset prices and by VAR based estimates of potential price volatility, that cycle is hard wired and as a result turbo charged (Exhibit 11). Liquidity, asset prices, and intermediaries'/ counterparties' net worth, become linked in the potentially self-reinforcing cycles described by, for instance, Hyun Shin and Marcus Brunnermeier [Shin 2010; Brunnermeier and Pedersen 2009].

(iii) Bank (and near-bank) liabilities: not just transactions money

Banks create credit and thus purchasing power. That has major macroeconomic consequences. But that impact is not well captured by the focus on transactions money, on money as a medium of exchange, which has dominated in most macro-economic treatments of bank credit and money.

In the predominant model, households and corporates have a “demand for money” which is captured by the function $f(i, Y)$. Money is needed to support transactions, which may be somewhat proportional to nominal income Y ¹⁵. But the demand for money balances is also influenced by the interest rate on bonds i , which determines the opportunity cost of holding non-interest bearing money. This thinking about a “demand for money” was a key element within the ISLM framework of the neoclassical synthesis, with a liquidity trap arising if the interest rate is already so low that agents are indifferent between holding money or bonds, and open market operations thus ineffective. It also underpins the monetarist focus on the importance of the money supply (the M in $MV=PY$), since it might seem reasonable to assume that over the long term interest rate cycle effects are neutral and thus the influence of Y dominates, making V reasonably constant.

But while the “demand for money” has played a key role in macroeconomics, it is not clear that it was ever a really useful way of thinking about the dynamics of credit and money creation, and there is a strong case that any value it did have has declined over time, in part because of the increases in leverage and the changing mix of categories of credit discussed in Section 4(i) above.

¹⁵ The focus on Y in the equation $MV = PY$ rather than on the aggregate value of transactions T , requires the assumption that T is broadly proportional to Y . It is notable indeed, that leading early economists such as Wicksell focused on T itself. Over the long-term, even the T/Y relationship can change significantly in the light of changes in for instance the degree of vertical integration: the more that economic functions are performed within large firms (with internal accounting between different steps in the value chain) rather than between firms, the lower the ratio T/Y . Over the short-term however the ratio may be reasonably stable.

Four aspects of reality make a focus on the demand for transactions money of limited and declining value:

- Money is held for different reasons. As Keynes noted in his *Treatise on Money (Book One: The Pure Theory)* money is held for several different purposes, only some of which are related to its role as a medium of exchange. [Keynes, 1930] Businesses and institutions hold some money to make transactions which are part of the value chains which deliver nominal GDP; but they also hold it for speculative and financial transactions (purchases and sales of already existing assets) which do not enter nominal GDP calculations. Households also hold some money balances to make current transactions, but in addition savings balances, whose value relative to money GDP is not driven by the transactions intensity of GDP.
- The complexities created by these different uses of money cannot be overcome, and focus on the transactions demand for money restored, simply by focusing on any given subset of bank liabilities, such as non-interest bearing checkable deposits. In the business sector, the need for transactions balances is in part determined by ease of access to credit facilities such as unused overdraft facilities. In the household sector, credit facilities (e.g. credit cards) also play a key transactions role. And the relationship between savings money and transactions money is fuzzy and has become more so over time. Savings deposits can become available transaction money not only as they reach maturity but also in many cases immediately if a small redemption penalty is paid. Savings deposits indeed can also be held in an interest bearing but instant access form. The need for pure transactions money is therefore influenced by the amount of savings money which households in any case hold and the way in which they hold it.
- The idea that the interest rate on bonds, i , determines the opportunity cost of holding money has become decreasingly true. Most money, and even some instant access money, is interest bearing, and that has become increasingly so over time. At some points in the economic cycle indeed, for instance during 2010 to 2011 in the UK, it was possible for a household to earn more on a savings deposit which was reasonably liquid and had certain capital value, than on a publicly traded bond subject to capital value pricing risk. Equilibrium in the relative demand for bonds and different categories of money is determined by differences between money and bond interest rates which can be either positive or negative, and not by the interest rate on bonds alone.
- Finally, it is possible for a shadow banking system to create close money equivalents outside the formal banking system, with these near money equivalents serving to support either current transactions or financial

investments/savings purposes. U.S. money market funds are close money equivalents, held in large quantity by households, but also by corporates/institutions: but so too, for large institutions, can be holdings of short term secured contract claims, such as those delivered by the repo and other short term secured lending markets.

As a result, any attempt to measure the definitive quantity of transaction balances, separate from other bank (or shadow bank) liabilities has become increasingly impossible¹⁶. But more fundamentally, it is not clear that thinking in terms of a “demand for money” best helps us understand the dynamics of credit and money creation. Instead it would seem more useful to think in terms of the following process:

- Banks (and shadow banks) create credit, influenced by central bank interest rate and other policy levers but also by the self-reinforcing dynamics of credit creation and asset price effects.
- Money necessarily arises as a by-product. The creation of a bank asset necessarily creates a liability.
- At the level of the whole banking system, this money can only be destroyed when and if loans are paid back. But there is no certainty that it will be paid backed by any of the subsequent recipients of money: it may either be continually recycled in current spending by each recipient, or held as increased savings balances.
- The amount of money created has to be freely held by some combination of households and corporates. Therefore a set of prices must exist which leaves corporates and households in aggregate content to hold the stock of money created, rather than to switch (in aggregate) from money to other assets such as bonds or property. Asset portfolio allocations have to be in line with preferences given the prices prevailing.
- But this equilibrium set of prices can be achieved (and indeed is more likely to be achieved), not by any pay down of debt somewhere else in the system (and thus destruction of the newly created money) but by some combination of:¹⁷

¹⁶ As Gurley and Shaw presciently noted in 1955, “as financial evolution proceeds, one salvages conventional quantity theory by so extending the concept of M and V that they bear little resemblance to ‘means of payment’ and ‘turnover of the means of payments’” [Gurley and Shaw, 1955]

¹⁷ Thus while, as per footnote 1, James Tobin argued correctly that it is possible for bank created money to be destroyed by debt pay down if depositors do not want in aggregate to hold the new money created, the fact

- An increase in interest rates on some categories of money balance (so that savings deposits pay close to or even above the bond rate)
- The purchase of other categories of assets (e.g. property) which induces a change in the price of those assets so as to bring agents' asset portfolios in line with preferences. Thus if money creation results in "too much" money for aggregate household portfolio preferences, balance can be restored by an increase in the value of other assets, such as property, rather than by a reduction of money balances (achieved by a pay down of debt).

The extension of bank credit, therefore, drives a matching increase in money or some other category of banking (or shadow banking) system liability – real sector assets to match the real sector liability created. And the aggregate value of these liabilities, or even of some subset which has strong "money like" characteristics, cannot be expected to bear any particular relationship to nominal GDP.

As a result, in a historical period in which economies have experienced the rapid growth in leverage and the changing mix of categories of credit illustrated in Exhibits 8 and 9, a decline in the measured velocity of money, was not only unsurprising but inevitable. In the UK, some households borrowed to buy houses and others accumulated large savings deposit balances (some of which indeed directly arose from the sale of houses whose value rose significantly relative to GDP); as a result the measured velocity of circulation declined. (Exhibit 12) And as Richard Werner has illustrated, the decline in the measured velocity of circulation in Japan, frequently described as an "enigma", was simply the inevitable consequence of the changing balance between the different purposes for which credit is extended and money is held. [Werner, 2005]

There is therefore a strong case that, as Benjamin Friedman has put it *"in retrospect the economics profession's focus on money – meaning various subsets of instruments on the liability side of bank balance sheets in contrast to bank assets - turns out to have been a half century long diversion which did not serve our profession well"* [B. Friedman 2012] Instead, as Stiglitz and Greenwald put it *"The focus on monetary policy should shift from the role of money in transactions to the role of monetary policy in affecting the supply of credit"*. [Greenwald and Stiglitz 2003] Indeed, as I will argue in Section 6, there needs to be an integrated consideration of how both monetary policy and macro prudential tools jointly affect the credit cycle and the on-going stock of debt.

that there are other possible (and in many circumstances more likely) adjustment mechanisms makes bank money creation a potentially crucial motive force of macro-economic developments.

But such a focus on credit and on ongoing debt contracts carries the implication that the quantitative stock of bank and other financial assets (and their matching liabilities) are matters of macro-economic importance, though for reasons other than any potential impact on price stability. One harmful consequence of the economics profession's focus on the demand for money indeed, was that when the relationship between money supply and the price level appeared to break down, central banks tended to lose interest in stock quantities. If velocity was so unstable over the medium term that money supply trends carried only very weak implications for price stability (as became increasingly apparent in the 1980s) then the money supply was perceived to be unimportant. The true lesson should have been that bank and other financial assets, and in particular the aggregate level of debt, are important for reasons quite independent of their immediate or medium term impact on price stability. Credit creation and debt build up can have important long-term consequences which will either never show up in price stability effects, or only after a long delay, at which point the dominant impact may well be deflationary rather than inflationary.

In the sense therefore the Bundesbank was right in its long-held view that short and medium term price stability prospects were an insufficient definition of monetary and financial stability, and that attention should also be paid to a quantitative "pillar". But it would have been better to define the pillar in terms of aggregate new credit and the resulting debt stock, not in terms of money.

Let me sum up my story so far. It goes as follows:

- Wicksell and subsequent economists rightly identified that bank credit creation was special because it created money and purchasing power
- Subsequent economists such as Hayek and Fisher rightly argued that credit cycles are of crucial economic importance for reasons unrelated to asset price stability.
- The potential importance of the credit cycle increases yet further when we consider the multiple alternative uses of credit, and the possibility of Minsky-style credit and existing asset price cycles as well as Hayekian over investment cycles.
- Credit has played a relentlessly increasing role in the economy, facilitated by deposit insurance, the development of interbank trading and liquidity transfer mechanisms, by globalization, and by securitisation and shadow banking.
- A focus solely on the transactions demand for money was always dangerously simplistic, and became increasingly irrelevant over time.

Credit is important. It is fundamental to purchasing power creation and nominal demand: and it became even more important over the 65 years since the Second World War, and particularly from about the 1960s and 1970s onwards.

One might therefore expect that macroeconomics would have focused on it ever more attention. In fact the trend, though with some exceptions, has been in precisely the opposite direction.

5. THE STRANGE AMNESIA OF MODERN, AND NOT SO MODERN, MACROECONOMICS

Olivier Blanchard noted in October 2012 that much of modern macroeconomics “assumed that we could ignore much of the details of the Financial System”. Mervyn King noted that the dominant new Keynesian model of new monetary economics “lacks on account of financial intermediation, so money, credit and banking play no meaningful role” [King, 2012].

Ideas matter: intellectual frameworks matter; and the absence of the financial system from modern macroeconomics played a role in the origins of the 2007-2008 crisis. One cannot see a crisis coming if one has assumed its possibility away. The strange amnesia of modern economics therefore requires an explanation if economics is to provide better insight in future.

(i) From Wicksell to the late 1980s

Mark Gertler provided in 1988 an excellent summary of the evolution up till then of economic thought on issues of financial structure. [Gertler, 1988] In its final stages, the story is one in which a desire for elegant frameworks, for simple policy guidelines, and for mathematical rigour overrode a commitment to deal with real world complexity. The result was either an assumption that the financial system is a pure neutral veil; or a focus on one issue only: on money as a medium of exchange.

As Gertler stresses, the tendency to ignore the financial system, and in particular to abstract from the details of bank credit and purchasing power creation, is not simply a product of the New Classical or New Keynesian approaches which have dominated the last three or four decades of economics. It was also a strong tendency in post-war Keynesianism and Monetarism.

Keynes himself, as already discussed, set out in “*The Treatise on Money*” an insightful discussion of the different functions of money, escaping from a sole focus on transactions demand. His “*General Theory*” includes brilliantly intuitive narrative descriptions of the potential instability of financial markets. [Keynes 1936] There is also a discussion of the importance of the “state of credit” and of the “state of confidence” of borrowers and lenders. But as Gertler describes, the macro-economic literature which followed “*The General Theory*”, largely ignored these issues. The neoclassical synthesis of the ISLM framework considers the demand for transactions money and the interest rate differential between money and bonds, but not the credit creation process, nor the influence of balance sheet stocks of debt. Policy oriented Keynesians meanwhile focussed on real flows of Consumption, Investment, and Government expenditure, on multipliers and fiscal policy, rather than on the financial system. And while Friedman and Schwartz’s “*Monetary History of the U.S.*” [Friedman and Schwartz, 1963] reasserted the importance of monetary variables, its

focus was almost entirely on the apparent relationship between transactions money and output, with little attention to the determinants of bank credit creation and still less to the implications of the balance sheet stock of debt resulting.

Gertler then describes the efforts of economists such as John Gurley, Edward Shaw and James Tobin to resurrect a focus on the details of financial intermediation. Gurley and Shaw's *"Financial Aspects of Economic Development"* [Gurley and Shaw, 1955] argued strongly that a focus on money as a transaction medium was both increasingly impossible (because of the multiple uses of money and the multiple ways in which money equivalents could be created) and inadequate, because of other important consequences of financial intermediation. They argued that balance sheets matter, and that "financial capacity" – a measure of borrowers' ability to absorb debt and thus to avoid reductions in either current or future spending commitments – could be a key determinant of aggregate demand. And they warned that with a *"sophisticated financial structure providing financial assets, other than money and bonds, in increasing proportion to both, control of the money alone is a decreasingly efficient means of regulating flows of loanable funds and spending on goods and services"*.

Gurley and Shaw's insights were further developed in the 1960 article which gave us the distinction between "outside" and "inside" money. [Gurley and Shaw, 1960] And in the 1960s and 1970s economists such as James Tobin and Hyman Minsky made important contributions, stressing the centrality of financial intermediation, of unstable financial dynamics, and of balance sheet quantities. Charles Kindleberger in 1978, meanwhile, provided an authoritative historical description of the reality that financial booms and busts often caused huge real economic harm. [Kindleberger, 1978]

But from the 1970s and 1980s the intellectual tide turned decisively in the other direction, with financial intermediation and the banking system disappearing from most macro-economic models. Gertler suggests three factors which help explain this unfortunate disappearance.

- First, the impact of Modigliani and Miller's theorem which appeared to prove that real economic decisions were independent of financial structure. Modigliani and Miller's (MM) illustration of the theorem was at the micro level, at the level of the firm. But it was assumed to apply also at macro level. And believers in the importance of financial structure, as Gertler puts it, did not have arguments expressed in the same formal mathematical rigour as MM with which to support their assertions.
- Second, the wider methodological revolution in macroeconomics in the 1970s, with the desire to base macroeconomic conclusions on robust and mathematical micro foundations. Laudable though this aim was, its implementation had a perverse effect. For it proved difficult to achieve

mathematical rigour without making the simplifying assumption of homogeneous representative agents: and that simplification effectively abstracted from the possibility of any imperfections and complexities in the financial contracting process. The financial system effectively became unimportant by assumption.

- Third, the fact that advanced econometric techniques (vector auto-regressions) appeared to suggest that money supply fluctuations, or at least unanticipated money supply fluctuations, could be important causal drivers of real or price level effects. While the interpretation of this in policy terms was debated, it appeared to reinforce the belief that if the financial system mattered at all, it was because of what happened in the market for money as a medium of exchange. The rest of the financial system it seemed, could be largely ignored.

(ii) Financial frictions in modern economics: concepts and limitations

It would however be unfair to state that modern economics has entirely ignored the details of the financial and banking system. Particularly since the crisis there has been extensive effort to link the observed reality of financial instability to robust micro foundations. And as Vincenzo Quadrini argues in a recent survey of literature and concepts, the 20 years before the crisis saw significant theoretical exploration of the inherent nature of financial frictions, and some consideration of their potential role in macroeconomic fluctuations [Quadrini 2011; see also Brunnermeier, Eisenbach and Sannikov, 2102]. As a result, Quadrini argues, many post crisis attempts to understand the financial drivers of macro-economic stability rely on *“approaches... [which] ... are not to new in macroeconomics... [but] ...based on ideas already formalised in the macroeconomic field during the day and last 2 ½ decades, starting with the work of Bernanke and Gertler (1989).* In particular:

- Considerable effort has gone into understanding real world drivers of the choice between equity or other state contingent contracts and standard fixed return debt contracts, moving beyond MM simplifications. Multiple papers have explored how asymmetries of information between lender and borrower (either *ex-ante* the lending decision or *ex-post* the realisation of project results) can, for instance because of “costly state verification” [Townsend 1979] create a preference for debt rather than equity contracts.
- Other work has built on this by observing that one response to imperfect information and agency problems is to lend against collateral, and has considered the potential macroeconomic implications of variations in borrower net worth. Such variations can drive cycles in credit demand, with exogenous shocks to present or prospective productivity producing amplified results [e.g. Kiyotaki and Moore 1997].

- In addition several economists, starting with the work of Ben Bernanke and Mark Gertler [Bernanke and Gertler 1989] have considered the implications of variations in the net worth not of borrowers but of financial intermediaries such as banks, thus focusing on the lender as well as borrower drivers of credit cycle amplifications illustrated in Exhibit 4.
- This strand of thinking has in turn been further developed by Marcus Brunnermeier and others in analysis of the self-reinforcing links between market liquidity, asset values and leverage, illustrated in Exhibit 5 [see e.g. Brunnermeier, and Pedersen, 2009]. Hyun Shin's Clarendon lectures on "Risk and Liquidity" set out a brilliantly clear exposition of such effects [Shin 2010].
- And the idea that credit markets have fundamentally different dynamics from other markets was given formal expression in Stiglitz and Weiss's exploration of how an Akerlof style "lemons" problem can produce a backward sloping supply curve for credit beyond some interest rate, with implications for the role of banks as superior screeners of loan application, effectively performing a rationing function. [Stiglitz and Weiss, 1983] This insight among others then led on to Greenwald and Stiglitz' conclusion, already mentioned, that the focus of our attention should be on the credit creation and allocation process rather than on money as a medium of exchange.

Modern economics can thus be absolved of the charge that it has entirely ignored the details of financial structure. But what is fair to assert is that the insights developed in this literature were largely ignored in practical policy implementation, and that limitations in methodological approach and in the breadth of issues considered stymied our ability to see how severe the problems which credit cycles can create are. Thus:

- While literature surveys can illustrate a rich range of relevant ideas, these appeared to carry few implications for real world policy. As Quadrini puts it, *"Although these studies had an impact in the academic field, formal macroeconomic models used in policy circles have mostly developed while ignoring this branch of economic research. Until recently, the dominant structural model used for analysing monetary policy was based on the new Keynesian paradigm... [which] ... incorporates several frictions such as sticky prices, sticky wages, adjustment costs in investment, capital utilisation and various types of shock. However the majority of these models are based on the assumption that markets are complete and, therefore, there are no financial market frictions."*
- And while the financial frictions explored in the academic literature were able to provide micro explanations of macro fluctuations, Quadrini's survey illustrates that in most cases the quantitative impacts suggested by the models were far smaller than those empirically observed in real world

episodes such as the Great Depression or the 2008 crisis. Theoretically robust analyses of financial frictions did not therefore challenge radically policy makers' assumption that financial frictions could largely be ignored.

- This failure to identify the potential scale of financially induced macro fluctuations, in turn seems likely to have reflected two related deficiencies in most models treatments:
 - First, as Brunnermeier et al note in their 2012 survey, most of the literature, and therefore their own summary in that paper, omits consideration of behaviourally driven “irrational” cycles in asset prices *“despite the fact that we think the departure from the rational expectations paradigm is important”*. As Quadrini notes in his review of the quantitative performance of different models, a crucial reason why they fail to predict macro fluctuations on the scale empirically observed is that the asset price variations which result from these models (and thus the changes resulting in borrower or intermediary net worth) are far smaller than observed in regular real world cycles, let alone in extreme bubbles and crashes.
 - Second, the vast majority of the literature ignores the possibilities of credit extension to finance the purchase of already existing assets, thus largely excluding consideration of self-reinforcing cycles in the price of assets, such as land or locationally specific buildings, which cannot be reproduced through new capital investment. Even in most of the post crisis literature indeed, the dominant model remains one in which household savers make deposits in banks, which lend money to entrepreneurs/businesses to pursue “investment projects”.¹⁸ The reality of a world in which the majority of credit is extended to households, in which households are net borrowers from some banking systems, and in which in some countries only a small proportion (e.g. 15%) of bank credit funds “new investment projects” with much of it instead funding the purchase of existing and non-reproducible assets, has therefore been left largely unexplored.¹⁹

¹⁸ Thus for instance, in Gertler and Kiyotaki [2010] the bank intermediation channel is described as follows: *“At the beginning of the period each bank raises deposits from households in the retail financial market at the deposit rate R_{t+1} . After the retail market closes, investment opportunities for non-financial firms arrive randomly”*

¹⁹ In fact Kiyotaki and Moore [1997] is one of the minority of models which does consider a non-replicable capital asset, i.e., land.

Orthodoxy on the eve of the crisis

It therefore remains fair to say that the dominant pre-crisis orthodoxy was one in which the process of credit and purchasing power creation, discussed so insightfully by Wicksell and other early and mid-20th century economists, was largely ignored. And that orthodoxy remains only imperfectly challenged and revised.

Thus:

- Standard undergraduate textbook discussions of banking and money still tend to propagate three myths/simplifications.
 - First, that banks in sequence “raise deposits” from savers and then “make loans” to borrowers, ignoring their potential to create purchasing power *ex nihilo*.
 - Second, that banks primarily lend money to firms/entrepreneurs to fund investment projects, allocating funds between alternative uses, largely ignoring the other potential functions and impacts of bank lending.
 - Third, that the “demand for money” (i.e., for transactions money”) is a crucial issue, and can usefully be captured in the function $f(i,y)$ ignoring the endogenous creation of short term financial assets as a result of credit creation, and ignoring the complexity of the varying features and degrees of “moneyness”.
- Advanced macroeconomics textbooks are also largely silent on the role of banks as creators of money, and on the potential importance of the aggregate balance sheet level of resulting debt.
- Similarly, the canonical statement of New Keynesian price stability theory, Michael Woodford’s “*Interest and Prices*” is almost entirely silent on the details of the financial and in particular the banking system. [Woodford 2003] Woodford’s title is of course, a homage to Wicksell. And Woodford’s exclusive focus on our ability to maintain price stability through management of the short-term interest rate (or expectations thereof), mirrors Wicksell’s focus in the final chapters of his “*Interest and Prices*”. But Wicksell’s analysis of the details of bank money creation is left unexplored: and with it, the potential for insights into the consequences of financial intermediation for issues other than price stability.

- Finally, both central bank and financial regulators, in the decades running up to the crisis, moved away from any belief that financial structures, bank credit creation, or absolute levels of leverage, have macro-economic importance in the fashion envisaged by Hayek, Fisher or Gurley and Shaw. Central banks gravitated to an inflation targeting policy regime: price stability as the objective, and interest rates at the tool. Monetary aggregates were of interest only if they had consequences for future inflation: when money/price level relationships appeared to break down, they were therefore assumed of no importance. Quantitative reserve requirements were largely abandoned. As for financial regulators, whether independent or within central banks, there was a strong tendency to treat the financial system as a market like any other, in which liberalisation was the key to competitive intensity, market completion and allocative efficiency, but with no focus on the possible macro consequences of the growing size, complexity and changing shape of credit markets.

6. DEVELOPING A NEW APPROACH

The pre-crisis policy orthodoxy defined price stability as the primary and it seemed sufficient objective of central bank monetary authorities. Financial regulators meanwhile (whether located within central banks or outside) focused on applying prudential rules on an institution by institution basis. That approach and division of labour ended in the crisis of 2008 and the severe post crisis recession with whose consequences we are still struggling. A new approach is required.

Several elements of a new approach have already been put in place in many countries. The importance of overall financial system stability is now recognized: and new macro prudential tools, such as the Basel III counter cyclical capital requirement, have been agreed. In the UK the establishment of the Financial Policy Committee, appropriately located within the Bank of England, establishes a clear responsibility for both the monitoring of overall financial stability trends and the operation of the new policy tools.

But the analysis of this lecture implies that these changes do not go far enough. For they still tend to define financial stability in terms of reduced probability of failure within the financial system rather than in terms of the macroeconomic instability which financial system developments can induce. They do not therefore address radically enough the fundamental role that the creation of credit and purchasing power plays within our economies and the risks that the resulting debt contracts create.

The precise implications of this for policy and institutions require careful analysis, taking into account the inherent imperfection of any policy regime and the danger that policy – while addressing one set of problems – can itself create others.

I will not therefore set out here a precise set of proposals. But let me at least propose for debate some aspects of a more radically changed approach. It seems certain that central banks/regulators must focus on previously ignored issues and measures, and highly likely that they will have to deploy new tools.

The most important shift in focus must be to treat credit flows and resulting debt stocks as crucial factors of macroeconomic importance, assessing the short and long-term consequences of:

- The level and evolution of real economy (as well as financial system) leverage. Recent papers by Alan Taylor and Moritz Schularick [Taylor 2012; Taylor and Schularick 2009] have already made an important contribution to our understanding of these issues.
- The changing mix of purposes for which credit is extended, and the economic value and risk implications of each different category
- The complex and self-reinforcing relationship between credit supply, investment and consumption levels, and asset prices.

And the policy toolkit will need to equip central banks/ regulators with the ability effectively to constrain both credit cycles and the long-term growth of leverage, both overall or in particular categories of debt. This is likely to require:

- A much more powerful counter cyclical capital requirement than that defined by Basel III and with a different guideline for its application. The current guideline proposes that capital requirements should be increased if credit is growing significantly faster than trend. But that implies that growth in credit is always acceptable as long as the growth rate is steady, even if that growth rate is faster than nominal GDP and even if therefore aggregate leverage is relentlessly increasing. When leverage is already high, however, even steady trend credit growth may be dangerous.
- The restoration to the policy toolkit of quantitative reserve requirements, which more directly constrain banking multipliers and thus credit growth than do increases in capital requirements.
- And the application of direct constraints on borrowers, in particular in sectors such as commercial and residential real estate.

Such a focus on such tools would amount to a very major shift from pre-crisis orthodoxy. But that orthodoxy did fail. Our new approach needs to be based on a return to fundamental analysis of the role which credit creation and resulting debt

contracts play in our economies, an analysis which was central to the work of Wicksell, Hayek, Fisher and more recently Minsky, but largely ignored by much of modern macroeconomics.

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