

Notes from Capital Wars

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1. Earnings power as a main driver of stock prices has been replaced by money power*

=> The main focus here will be the 130\$T pool of footloose capital, two-third bigger than World GDP

The result of 07-08 GFC happened due to a dramatic escalation in monetary tensions triggered a frantic scramble for US dollars

- EU demands alone exceeded a whopping 8\$T

- Yet no automatic international lender of the last resort, and the IMF firepower then still only count in billions, outside of the US Federal Reserve and its swap lines, that was large enough to backstop the system.

Gap still remains and the US swap lines have become even more politicized, which means that they target "favored nations", which exclude Emerging Market economies and, pointedly, China, The Biggest Dollar user. US decisions to deploy Fed Swap lines, and whom to allocate these to, have become Nero-like choices (blue/red pill) and conditional on who sits in the White house. With debt >17\$T debt owned by non-US corporations and with over 2/3 of this debt US dollar-denominated, these decisions matter.

2. Global Liquidity continues to outpace World GDP.

=> The crucial role played by the US Fed Reserve means that its actions dictate risk-on/off conditions abroad. Consequently of this, Fed Watching has turned into a much-prized skill

=>The crises that we went thru and the subsequent injection of over 10\$T into financial markets through the widespread adoption of explicit quantitative easing by CBs over the world, as well as more recent "dalliance"(casual relationship) with quantitative tightening(QT) all underscore the importance of monitoring and understanding liquidity conditions Worldwide. = **MONEY MOVES MARKETS***

But who controls Finance(money) then? The drivers of GL are financial and exchange rate relationships within and between countries and the determinants of cross-border flows of money, securities, goods and services.

=> These factors have been the main reason there is an escalating Capital War between the US, EU and CH.

=> Basically a war between nations, fought in investment markets, that parallels the more familiar concept of trade wars and which ultimately involves a battle for currency supremacy in the World economy

=> GL shocks compound and spread internationally via cross-border flows.

- These shocks obey 3 rules:

- 1) David Hume's specie-flow mechanism, updated to include cross-border capital flows

- 2) Gresham's Law, where overvalued(bad) money driver undervalued(good) money out of circulation and into hoards

- 3)Triffin's dilemma over international confidence in the US dollar

- ^I recommend to Chat-gpt these 3^

3. Deregulation of both domestic markets and cross-border capital flows, lower taxes and lower inflation rates have together helped to mobilize the huge cash-pools in money-centers(LON, NY,TKY) into fast-moving and sometimes menacing cross-border flows towards countries with high growth(which typically see natural shortfall of domestic savings relative to investment opportunities)

=> Same goes in the other way tho. When growth slows down, financial capital typically quits in step with the slowing down in investment opportunities

This clustering and commonality of capital flow movements, both countries and between asset and liability components, highlight the importance of understanding the Global Liquidity cycle and its “push” factor.

America plays an important role here. As an Economic superpower means that her external payments position could provide a convenient “Cushion” or “shock absorber” for the Rest of the World against these waves of international capital.

*Interesting dynamic: Countries that are with savings-surplus are generally not relevant for investment opportunities(capital flows into them) until they start spending and generating opportunities.

=> America's economy was heavily boosted by the two World Wars and notably, her growth and generous savings surplus, which at first sight resembles China. But unlike our current setting, America's ability to fund post-war reconstruction in the 1920s/1950s coincided with huge investment and savings shortfalls elsewhere. Thus, the US could easily export savings thru big foreign trade, even tho this makes her vulnerable to Tariff Wars and a subsequent trade contraction in the 1930s.

Things in the 1960s changed, due to Advanced economies, most notably Japan/Germany, that had been rebuilt already and global savings were again abundant. These countries now instead of needing access to scarce capital, these economies now instead hunted export opportunities, and in the meantime protecting her imports by limiting home industries. Akin to an Investor, they wanted to export excess savings in order to generate yield/have capital in markets.

Their open financial markets and with the background already set thru elimination of control on capital thru 1950/60s, the US/UK economies started to run ever-larger trade deficits in order to accommodate Asian/European countries surpluses, but this came at cost in the form of:

1) High unemployment

2) More Consumer debt

Yet ironically, these large deficits were actually a better measurement of competitiveness of UK/US finance, then a signpost to their relative industrial inefficiency.

Lately, the vast economic changes that followed the fall of the Berlin Wall, the entire world has abundant saving pools, with China having to deploy an annual 6\$T nest-egg(Amount of money saved for future liabilities payments, such as pensions). More, and more economies are seeking to increase their trade surpluses = bigger net exporters of capital.

=> However, someone needs to run a large counterpart deficit in order for this to happen i.e. other economies. And, since these deficits = deficits for the domestic manufacturing industry which is a key source of future productivity growth + urban employers, this policy creates emotive political challenges.

Given that the true price of money is the exchange rate(not the interest rate) and America losing her willingness and her ability to accommodate excess savings from other countries, especially China, What currency arrangements now best serve the diverging interest of the US and her competitors? Here

Bretton Woods(1944-1971) was the best answer to this question up until the falling of it.
Nowadays, the exchange rates are floating, alongside them capital flows progressively unregulated.
- floating = either fixed to the floating dollar, or closely shadow it

4. Every national crisis is preceded by an economic boom, although not every economic boom has been followed by a financial crisis

=>Cause is not so much floating exchange rate(ER), but rapidly shifting cross-border capital flows

=>Economies that suffer crises, tend to have experienced above-average increases in flows, which leads to high financial asset/real estate prices.(You borrow on these assets, prices fall when flows go some other way and you need to liquidate eventually)

Smaller economies the rising ratios between Investment inflows/GDP were multiple times bigger for them(IRE, GR,SPA, ICEL) with their large-scale inflows resulting, ironically, from the whopping debts issued by their banks/corporations in the big money centers(NY, FRA, LON). In the meantime, fast Growing emerging markets were all eager to buy more US dollar “safe” assets. Admittedly, these flows were at times unusually large: China when she joined the WTO in 2001, and the oil exporters when they benefited from the tripling of crude oil in 2001/2006.(You can see the demand for safe assets thru this capital flowing into these markets)

These risks were acknowledged by the architects of Bretton Woods, They deliberately restricted private capital movements, blaming the 1930s Depression and the turmoil of the interwar years on the violent swings of capital flows.Ironically, the original case for floating ERs largely ignored capital movements, seeing them, at worst, as adjusting passively to current account imbalances.

=> Not only, did they miss with the size/velocity of these capital flows, but they failed to recognise that it's likely that Current accounts adjust to capital flows

=> Additionally, there is no reason why capital flows should sum to zero. In fact, they are the necessary counterpart to current account imbalances. Also no reason why large/small net capital flows tell us everything about ERs.

What matters for the ERs, is the “Net Balance between overall supply/demand”

=> Surge in Capital inflows is likely to increase ER, without the corresponding increase in supply of currency. And even when the ER is bid higher, there is no guarantee that it will rebalance flows.

ER movements act as a more plausible equilibrium mechanism following trade shocks than after capital flow shocks.But in reality, in the wake of a Capital Flow Shock, its often hard to predict if the financial system will Converge/Diverge from equilibrium, because Capital flows, may, at least for a period, become self-sustaining, so causing Assets/Currencies to overshoot.

=> Rapid, large-scale cross-border capital flows consequently demand equally large offsetting movements both in current accounts and potentially in ERs. Many countries have insisted on maintaining currency parities against competitor currencies, and most importantly staying closely aligned with the US dollar in order to help ensure economic stability.

4.1 In the modern world, Central Banks have power, but they do not always have control. At the same time though, often they exercise unelected powers. Parallel to this, it seems that modern financial crises have less to do with lax regulation(laws that are not strict/rigorous enough), excessive risk-taking by imprudent bankers and policy-makers obsession with inflation-targeting than might be presupposed.

=> We must focus more on GL and its role in the raising cross-asset correlation and its contribution to systemic risk

Expansion of domestic credit and heightened asset demand in previous crises was largely due to inflows of cross-border capital and easing of funding constraints of local banks. The subsequent extra ability to borrow allowed govts/businesses/households and even other banks to side-step burdens of existing debt, sometimes for years. And each of the following crises occurred when appetite for new debt slowed.

=> This forced liquidations of remaining assets to repay debts and often occurred alongside a sliding national currency unit when the direction of capital flows reversed. At the same time, the collapse in their capital bases forced banks to sharply shrink loan books, which, in turn, led to further falls in the value of bank capital and even tighter credit conditions.

Not only that it's the reverse of what happened in boom years, it sounds like the classic "debt-deflation" model described by Irving Fisher in "Booms and Depressions" (1932) and brought up-to-date by Rey(2015) described as a single global factor and we explain in terms of GL.

^Debt-deflation: in times when there are high levels of debt relative to income or assets can lead to an downward spiral in the economy when any reduction in asset price can trigger a chain reaction of defaults, asset sales, and further deflation

5. GL = total inflow of savings and credit into domestic and cross-border financial markets.

=> GL could be split functionally/Geographically by type of liquidity, which helps to isolate its changing quality. *Some components exercise a greater influence over the future size/direction of the total pool.

=> 3 Main Components:

- 1) CB provision
- 2) Private sector supply
- 3) Cross-border inflows

Furthermore there are three broad liquidity transmission channels, each one affecting/amplifying risk-taking behavior.

1) Sum of domestic CB and private sector liquidity tends to affect relative prices of "safe" assets, through a risk-taking channel(Describes the way monetary policy can affect risk-taking in investors).

-By reducing the odds of systemic risk, more domestic liquidity increases the term premia on gov. Bonds as the demand for safety falls, while reducing the equivalent premia assigned to risk assets. Term premia is the additional return investors require for holding an asset. Additionally, when the "safe" asset is used internationally, cross-border inflows are also likely to come into play.

2) The Exchange rate channel reflects the changing quality-mix of liquidity between private/public sectors.

-More Private Sector liquidity/Good liquidity strengthens currency, whereas CB/Bad liquidity weakens it

3)The spillovers of domestic liquidity from the core economies into outward cross-border capital flows are typically amplified by offshore funding markets and by policy-makers in the periphery economies into bigger increases in GL and subsequent, risk taking by investors

These dynamics of liquidity factors are typically ignored in finance theory but their effects can be seen in the jump of Wall Street, by almost tenfold. Yet, profits are up by 236% and so could just justify less than 1/4 of this rise. The increase in investors' appetite for risk assets proved more decisive, with equities(help directly/indirectly) rising from 14% of aggregate US financial wealth to more than 42% and safe asset holdings tumbling at the same time. Similar experiences worldwide.

Now with CB actively pursuing QE policies, industrial corporations flush with cash and aggressively buying their own shares, and wealth levels in EM rising, the liquidity theory of investment has never been more important.

6. The current situation with China and her hook around the Dollar is basically the same situation with Silver and China's consumption and need of Silver or the Silver Peso. Where back in the day there was more Silver peso circulating in China, than in Mexico itself(at times at least). It took China 50 years to eliminate this huge silver arbitrage. Later happened again when the Chinese population jumped, literally fed by American crops, which triggered further large demands for silver. And now happening again with the dollar.

=> Yet the modern international monetary system is becoming evermore ill-suited to intermediate our current vast capital and trade flows. Especially not designed to accommodate a billion of hard-working, high savings Chinese people determined to pull their country out of poverty. No surprisingly China is eager to displace the US dollar and America's financial imprint, especially in Asia

Not only that China needs to create an alternative international means of settlement that looks like the Swiss Franc more than the Argentine peso, but whether she can get off the dollar hook, the challenge adds a political dimension

=> This highlights the great importance of Seigniorage, namely the facility of national monies to command a greater purchasing power. I.e. the ability of say US authorities to buy real resources with 100\$ bills that costs only a few cents to print. All of the previous empires had this in common.

=> Key risk to international financial market stability is that China is to hooked on the dollar
= She effectively re-exports US dollars, when she exports Yuan.

This will likely have big cross-border effects as it forces China to open her domestic bond market to foreign capital, invoice more and lend more in Yuan, onshore or regionalise more of her supply chains and establish and promote a digital Yuan currency

If capital is power, capital also needs power. What constitutes a safe asset embodies a crucial geopolitical dimension. Example for this is the British Pound when he dominated the 19th century in many ways due to her vast navy and "fire power". Her power was showcased regularly, due to the fact that this promotes her power. The fact is that Capital wars are not simply battles for currency supremacy.

=>America's domestic policy imperative, this being her loose US monetary policy/tight fiscal mix, alongside China's productivity catch-up essentially results in an unstable financial World.

= This leads to tensions between the strength of the Chinese economy and the evermore inadequate supplies of US treasuries, for "safe" savings assets, incentivises more and more dangerous complex forms of financial engineering.

7. The wealth of modern capitalist societies appears as an immense collection of stocks/bonds/short-term liquid instruments which total to more than 250\$T of listed assets, even ignoring the sizable pools of unlisted and off-market OTC instruments. This explosion of World financial markets that has occurred since the early 1980s has been paced by similar-sized explosion in Global Liquidity, with much of these flows criss-crossing between international borders.

=> This liquidity, totals close to 130\$T. World Credit markets have become both more international and more interconnected, spanned by complex intermediation chains, involving so-called Shadow Banks, and financed by the increasing use of market-based collateral.

=>The cross-border dimension is especially important because it links the fortunes of Emerging markets to the gyrations of Western wholesale money markets in the core economies.

Through a network of foreign currency loans made to local/regional banks, large global banks domiciled in the major financial center are funded through Repos/Commercial paper, denominated usually in Dollars.

These funds are on-lent often against local currency collateral, which means that Dollar devaluation encourages still greater leverage. **And on top of this dynamic, local policy-makers typically try to monetise these capital flows, further fuelling the GL cycle.**

= GL experiences big swings and its annual growth has often been negative and generally it appears to amplify the US moves, likely operating thru the mechanism that was explained above

The dominant contributors to GL big size are China/US/EU and Japan. Meanwhile UK/Swiss look small compared to them, their financial influence with foreign exchange trading centers and use as international banking, as well as through cross-border foreign currency lending undertaken by both of them is still quite important.

8. Global liquidity is the national capital feeding through the world's banking system and wholesale money markets and used in/between World Financial markets to facilitate debt/investment/cross-border capital flows.

=> There are 3 specific sources of GL that are discussed in the book:

1) Domestic Private sector funding = corporations/banks and shadow banks/financial institutions for example

2) Official Monetary Institutions = CBs

3) Foreign investors and lenders thru cross-border flows

We think of liquidity in terms of the Sources Of Funds available for the private sector to use, rather than the traditional way of defining money supply as bank deposits, which is the Use Of Funds. Credit in other words national/international IOUs, dominates GL. Monetary savings sit alongside this.

Money is sometimes thought of as a higher form of credit that is underwritten by the State. Liquidity on the other side is a loose/more fluid concept than money, because it includes "moneyness", which is a qualitative attribute, much akin to the roots of the term credit from credibility/belief in latin.

= This Belief or attribute we must say, gives Liquidity elasticity and moves pro cyclically with business activity

Liquidity in accounting terminology, measures the ability of a household/firm/investor to pay their upcoming liabilities at any point in time.

Lance Taylor: **"Liquidity is often interpreted as a measure of the financial flexibility of an individual actor, group of actors, or the financial system as a whole. It represents the resources readily available for purposes of capital formation or financial transactions "**

Liquid assets are referred to as "assets which can be exchanged for money(or other liquid assets such as money, normally through the intermediation of money) at any time, at short notice, and at a relatively small transaction cost". This feeds into the decision to spend on Good+Services or:

= The decisions that determine the level of total demand are influenced by the liquidity of spenders. Furthermore, spending is not limited by the amount of money in existence, but it's related to the amount of money people think they can get hold of whether the disposal of capital assets/borrowing

7.1 Liquidity can be both used to describe the ease of financing or "funding liquidity", i.e. the availability

of cash to meet expected liabilities, And the ease of trading or “market liquidity”, i.e. the ability to buy/sell assets and commodities in size around current prices.

=> Funding Liquidity - Represents the measure of balance sheet capacity, or the private sector's access to finance thru savings/credit, with future liquidity growth dependent both on lending by traditional banks and by the credit provided by international and collateral-based wholesale markets(Shadow banks, banks which function like banks, but not perceived like ones)

=> Market Liquidity - the ability to execute large transactions with limited price impact. Also associated with low transaction costs and immediacy in execution.

Funding Liquidity and Market liquidity are closely connected, particularly in market-based credit systems. The fact that they can interact adversely to create dangerous downward liquidity spirals suggest that they must be taken together, not as independent of each other. Changes in the market liquidity can easily affect Funding Liquidity by adding frictions and costs, potentially reducing market efficiency and disrupting economic growth. Especially if any of these affect the counterparties to transactions, which are the specialized market makers(Banks/Trading firms) which provide vital liquidity and risk-taking roles. And Funding liquidity in the same time can affect the market liquidity because if these intermediaries can't continue to be involved in the buying/selling of financial securities without an immediate off-setting transactions, and therefore carry/fund inventories the market liquidity for these securities can plunge.

7.2 Global Liquidity's strength is partly dependent on the buoyancy of capital asset prices and exchange rates, which makes it move procyclically, or much like domestic funding liquidity.

=> As well as possessing national/cross-border dimensions, GL similarly has private/public components.

Quantitatively, private sector liquidity(i.e. Good liquidity) dominates publicly created liquidity in size, but qualitatively Finance Ministries/CBs matter more, especially in times of economic stress. Alongside the latter part, traditional high street banks also hold a unique position within the financial system because their credit can create deposits*.

=> How does this work?

When a bank makes a loan to a borrower, it credits the borrower's account with the loan amount, i.e. creates a new deposit in the borrower's account. And effectively increasing the total money supply in the economy. The borrower can then use these funds for various purposes, such as making purchases/investments. Although there are Reserve requirements, banks still can/and do create deposits through receiving 100\$ in bank deposits, and creating 90\$ out of thin air.

This feeds into the Multiplier effect, or the process of lending and deposit creation multiplier effect on the money supply. Furthermore, when a bank lends out funds, the borrower typically deposits the funds into another bank, which in turn can lend out a portion of those funds, leading to further deposit creation and expansion of the money supply.

=> How does the TGA spend?

When the Treasury spends from the TGA, it typically does so by instructing the Federal Reserve to credit the accounts(deposit creation) of the recipients of government payments. These recipients may include individuals/businesses/ gov. Agencies/other entities or high street banks.

Here is the crazy part. These recipients can deposit into a high street bank/be a High street bank which further expands the Money supply.

* There is an important back stop provided by the last resort facility, that provides deposit guarantees for investors. The problem is that the biggest limit is 250k\$(for America), other countries providing way less. So what happens when these backstop boundaries are exceeded by, say, large-sized deposits from corporate or CICPs, or by non-regulated banks requiring emergency funding, such as shadow banks and foreign banks operating outside their national jurisdictions. At these times credit risks can escalate(GFC for example)

7.3 Dynamics behind liquidity can be understood by digging into the evolution of money. Historically money appears in two general forms:

- Commodity money, such as gold/silver
- Credit money, such as banknotes and loans

These twin forms, in turn, both serve two uses, respectively:

- Standard of value
- Means of circulation

The standard of value function is paramount and determines circulation insofar that “Money Circulates because it has value, but it does not have value just because it circulates.”

Thus Commodity money can be invested for longer and is typically hoarded, while Credit Money devalues and is passed on faster.

Furthermore, Commodity money is counter cyclical, while Credit money is procyclical. They are also characterized by varying degrees of elasticity, and they depend on the growth, development and innovation of the financial economy.

=> In a commodity-based system, declines in the price level, i.e. increases in the price of money, lead to an expansion in the money supply as the production, say, of gold is stepped-up. This does not tell us whether or not gold will be hoarded given lower prices, but *Importantly” new supply should automatically occur because it has now become more profitable to mine gold.

= Thus, liquidity in this system depends on the production of precious metals.

This property is self-balancing since the supply of commodity money expands as the price of money rises.

=> In contrast, in a modern debt-based financial system(Credit money), the supply of liquidity crucially requires issuance and take-up of new credit. This is often dependent on the prevailing pricing background, because in periods of deflation and falling prices, i.e. increases in the money supply, borrowers are more reluctant to borrow and lenders become less willing to lend, since default risks are greater when the real value of debt rises.

= Here, unlike the previous system, the new supply of liquidity is procyclical because new credit faces rising costs for the debtor in a deflation, and in contrast becomes cheap in an inflation. Therefore, the supply of credit money contracts as the price of money rises(i.e. Price deflation), but it expands when the price of money falls (i.e. Price inflation)

= Movements in the US\$ epitomize these effects in cross-border lending markets, because a strong US\$ exchange rate often has the same effect as monetary tightening, and vice-versa.

Liquidity is not fungible in crises(i.e. It quickly disappears) and nor can it be properly measured by the level of interest rates.

8. These days the most visible and most discussed monetary instrument remains the policy interest rate, in modern times, this is typically a market-based overnight rate, such as US Fed Funds. However, when the economic background is characterized by the need to refinance large outstanding debts, rather than to finance new capital projects, *Balance sheet capacity*, i.e. liquidity, is crucial, and the cost of capital, i.e. interest rates, becomes secondary.

Self Notes: Great example given recently by Michael himself is that, a Household that needs to refinance in order to not be homeless wouldn't care what's the interest rate, or a Corporation that needs to survive. The important thing here is, can they find a Lender, and is the Lender willing to lend.

Thus, setting the short-term interest rate is, by itself, an inadequate monetary policy tool, and that so-called "Forward guidance" on rates, QE/QT, and changes in the banks' regulatory capital/asset ratios matter much more.

=> Using these tools above, CBs and Financial Regulators can affect the aggregate growth rates of money and credit by slowing/stimulating the expansion of banks' assets and liabilities. Notes and coins, as well as bank deposits, loans and securities all exist in the real world and their rates of growth are affected by these policy decisions. In other words, "All money that is anywhere, must be somewhere"

Attention has, consequently, re-focussed on alternative monetary channels, such as the quantitative effects of these direct supplies of credit and overall capital market funding conditions. By disturbing balance sheet quantities and specifically the balance sheets of financial intermediaries that invest and directly supply credit to the private sector, the policy-makers can affect risk-taking, wealth and collateral values, and, hence, GDP.

9. Modern industrial economies are usually dominated by a capital expenditure cycle. Economic Growth is dependent on capital accumulation, which must be "Financed". Key characteristic of Capitalism is that Investment is financed by liquidity, and not just through savings.

=> Capital is raised over several years, with funding needed to be refinanced several times over this period. This is especially true today, given the large outstanding stock of debt that needs to be refinanced every year.

In turn, the Refinancing process is a frequent source of weakness. Mismatches in assets/liabilities can occur at different times between gestation and the project completion, leading Cash pay-outs to fall short of cash receipts and, thereby, threaten illiquidity, regardless of long-term solvency. It follows that there are predictable financial regimes which are stable/unstable.

=> *The modern business cycle is increasingly dominated by changes in the broad capital structure, rather than simply by changes in the underlying pace of the economy. Modern capitalism has become a refinancing system, rather than a new financing system.*

9. The global financial system has moved from retail bank-based credit provision to wholesale market-based provision, most notably the repo, where gross funding, i.e. refinancings and debt rollovers dominated net credit provision, i.e. new financings.

=> But Repos require stable collateral.

Traditionally, this has been provided by "safe" government bonds, but in recent times due to the widespread pursuit of austerity policies by several Western governments, and often with the IMF's blessing, has limited the new supply of these "safe" assets.

In turn, this has required ever-larger balance sheets that are required in order to roll-over these sizable positions.

=> Consequently, lower quality private sector securities are being used as an alternative source of collateral, but this means that private sector debt makes liquidity procyclical and potentially fragile.

This requires a huge injection of “safe” government assets, thru more bond issuance, and/or greater CB liquidity. This has not been the case unfortunately. Policy-makers are making things Worse.

9.1 Dislocations in the real economy in the 1960s mostly took the form of wage and labor cost shocks, and in the 1970s oil and commodity price shocks. Now we face an entirely different regime, where financial shocks are common.

10. Main drivers of Global Liquidity are the US Federal reserve, and increasingly, the PBoC.

=> By balance sheet size, the PBoC is ½ bigger than the Federal reserve. Due to her size and her use of the Dollar, she helps to stabilize the dollar.

Both economies' private liquidity is increasingly collateral-based, rather than bank-based, and it depends significantly on attitudes towards risk taking, and the perceptions as to what constitutes “safe” assets.

10.1 The rise of non-traditional banks(Shadow banks) as providers of funding rather than just new credit, has compromised existing methods of monetary control. Or expressed differently, the financing chains have grown more in length, than in number. They are fed by the recent CICPs, which largely owe their existence to geopolitical developments, demographics and financial deregulation over the past twenty-five years.

=> This capital is quickly moving to new industrial technologies and have exploited, namely these fast-moving flows of GL

The disconnect between economic textbooks and practical operation of the economy have been separated widely. Theoretical assumptions, critical for market equilibrium between producers and consumers, are probably absent and the independence of supply/demand, vital for economic stability and the academic case in favor of free market capitalism are being more frequently questioned.

=> The catch-up from Emerging markets and the technological innovations, drive increasing returns from production and help underwrite free web-based products. These forces skew the Western economies more into the service industry, but alongside they also intensify the use of debt, widen trade deficits, change the distribution of incomes and alter the patterns of saving.

11. Financial innovation is an important factor behind the more elastic liquidity supply. In the earlier bank-dominated financial world, M2 money supply, defines as the sum of notes/coins/bank deposits, served as a decent measure of balance sheet size of leveraged lending institution, but today this ignores important market-based liabilities(REPOs, Commercial paper, and large-sized corporate deposits)

=> Market has moved from:- unsecured > secured funding.

- shift in the denomination of GL towards US\$, which much of it transacted outside of the US.

- Alongside these, there has been a shift in the benchmark rate for global US\$ funding from bank-based LIBOR in the Eurodollar markets to the collateral based US repo

rate.

- shift in credit provision from the balance sheets of Global Banks to the balance sheets of asset managers and broker-dealers.

- shift to alternative monies, such as cryptocurrencies, as well as alternative policies, such as the latest proposal for People's QE, signaling the distrust of people towards Policy makers.

^People's QE = policy proposed in 2015, that will make the Bank of England create money and invest in housing/transport in the UK. This would aim to turn the UK into a high-skill, high-tech economy and to build more council houses in order to lower the long-term housing benefit costs.

11.1 We can better understand the Challenges that Policy-makers fail to keep up with or even acknowledge in terms of the three key features of modern economies, namely:

- 1) The high productivity of industrial capital
- 2) The ever-greater elasticity of finance
- 3) the persistent instability of the investment cycle, and
- 4) the economic "catch-up" of Emerging markets(EM), and most notably China

All can be found in today's financial markets. Instability is becoming more regular, more inclusive and deeper. What's more, these crises are systemic, not idiosyncratic. Roots being above, and most notably the "catch up" from EM, and the shift from "capital-raising" to a predominantly capital distribution-focussed financial system. The latter part features inventive bankers(new financial instruments, introducing more risk) and rapacious speculators(greedy), rather than innovative industrial entrepreneurs, with the economic cycle ranging from periods of ever-greater regulation, followed by periods of sweeping deregulation.

12. As far as academics go, they have until recently either ignored liquidity factors entirely or else grudgingly accepted them as annoying frictions. Traditional economic textbooks argue that output is demand determined in the short run, and monetary policy stimulates aggregate consumption and investment. Yet they fail to acknowledge the very essence of financial markets, these being Spreads and Risk premia.

=> Spreads = The different yields across different securities, e.g. government/corporate bonds, influenced by credit risk/market liquidity. In a way ignoring the Quality mix in the system as well

=> Risk premia = the additional returns that investors demand for holding risky assets, reflecting compensation for bearing risk

They claim that everything could be explained thru textbook models, and completely and utterly ignore phenomena that should be interesting to economics, e.g. quantity rationing, deep uncertainty, involuntary unemployment, inflexible or sticky prices and Balance sheets(Since in this world, why hold assets or be required to manage Asset and Liabilities duration?)

=> Phenomena above being:

1) Quantity rationing = scenario where demand exceeds supply, usually due to constraints in production and/or distribution. This can have implications for resource allocation, pricing, and consumer welfare

2) Deep uncertainty = Unlike risk, which involves having information on the probabilities and outcomes of certain events, deep uncertainty refers to a situation where the probabilities and outcomes of events are unknown or highly uncertain. It poses challenges for long-term planning and decision making.

3) Involuntary unemployment = occurs when individuals are willing and able to work, but can't find a job. Usually due to cyclical fluctuations such as during a recession or periods of low demand

4) Inflexible or sticky prices = refers to prices that are not reacting to changes in supply/demand. Usually due to fixed prices contracts, menu costs(cost of changing prices), or psychological factors affecting the price-setting behavior. This can lead to imbalances between demand/supply, resulting in shortages or surpluses in markets

5) Balance sheets = you can always find cash for liabilities if there is a lender willing to lend. Problems occur when you can't find this lender and you don't have the matching assets.

Economists worship the foreign trade and current account balances, yet fail to realize that economic welfare is surely determined more by the sum of exports and imports than by their differences, because the size of total trade governs the division of labor.

^How does the size of total trade govern the division of labor? =

1) Market size and specialization: Large volumes imply a larger market for goods/services. When these large volumes occur, this means that businesses have more opportunities to specialize in producing specific goods/services. This can lead to cuts in the average production costs as output increases.

2) Increased volumes means that firms now have access to a wider range of technologies, inputs and resources from all around the world. This facilitates innovation and the adoption of new technologies, further boosting output.

3) Trade allows economies to diversify risk across different sectors. I.e. diversify production and export base, and thus mitigate the effects from fluctuations in demand/supply.

What's more is that many experts simply assert that capital flows passively adjust to balance the corresponding trade surpluses/deficits, but in reality not only that the size of current accounts is often forced to passively adjust to capital movements(in/out), but these net flows themselves hide a richer and much wider network of gross capital flows which involve Buying/selling of different assets and large-scale borrowing/lending, and all involving both foreigners/domestic residents.

=> Digging deeper into these net flows and in general within the international balance sheet of economies, reveals that the bulk of cross-border capital movements are speculative portfolio flows and bank financing flows and not FDI(Foreign direct investments).

These flows appear to be exported from high savings Emerging markets economies to a few advanced economies with relatively slow domestic demand growth, but mature financial markets.

(important to note here: Economies with strong industrial economy, don't have strong financial markets.)

12.1 Gross balance sheet analysis shows large-scale bank and portfolio flows heading into Emerging markets, and slightly larger amounts flowing back into the deeper capital markets located in NY/London/Frankfurt, reason often being the search of "safe" assets, i.e. risk-seeking capital enter while risk-averse capital leaves, the former tends to be more long-term in nature than the latter.

=> Importance of Gross Funding dimension = modern economics takes every credit as debt(debit), every debt as credit, so assets and liabilities must match, and the system balances to zero.

= Thus never acknowledging either:

1) The character of these flows

2) How big are these gross numbers;

Regardless of how much credit/debt there is in the system, the net figure is always the same.

- 1) Market depth: the ease of selling/buying an individual security in size and at short notice, without affecting price
- 2) Money-plus: refined term for the economy's entire money stock, or some characteristic of money (broad credit or equally high-powered money)
- 3) Risk: gauge of the robustness of financial sector balance sheets, or "the ability to settle obligations with immediacy, i.e. a bank is illiquid if it is unable to settle obligations in time"

1) Risk + Money-plus = funding liquidity

2) Market liquidity = difference between the transaction price of a security and its value

=> Example of this would be, heightened market risk(due to greater realized asset price volatility), that leads to higher margin requirements(high volatility in MOVE, collateral values down, more collateral needed for the same funding in the past), and, hence, tighter funding liquidity, which in itself feeds back to reduce market depth and further undermine market liquidity.

[illegible]

^M1 gap = money supply relative to economic activity, or in other words, large deviations of what's considered a sustainable money supply, leads to inflationary/deflationary pressures depending on if it's above/below these levels. Detrended ratios to GDP means that M1 is adjusted for trends in economic output(GDP) to isolate changes in the M1 money supply that are not explained by economic activity

2) Global liquidity measures outperform domestic measure as early warning indicators of asset price boom. It also confirms the conclusion of BIS(BIS, CGFC 2011) that quantity measures are better suited to capture the build-up of potential risks.

2.1) This research also notes evidence that Basel 3 capital, leverage and liquidity rules are likely to reduce traditional bank-based intermediation in favor of shadow banks.

=> Which means that in the future we need to extend the scope of quantitative measures of liquidity to include shadow banks in order to support their early warning properties

3) There are procyclical amplification mechanisms embedded in the modern financial structure

3.1) Single global factor can explain up to a quarter of the variation in World Risk asset prices

3.2) These are confirmed by a research done across 17 advanced economies over the past 150y, concluding that the co-movements of credit/housing prices/stock markets have hit historical highs during the past 3 decades.

They both put weight on the notion of a Global Liquidity cycle.

4) Global Liquidity is negatively correlated with interest rates and positively related to equity returns.

5) Research done by the IMF(2010) examined the linkages between global liquidity expansion, asset prices and capital inflows in emerging economies.

=> They found that rising GL is associated with rising equity returns and declining real interest rates in 34 "liquidity-receiving" economies.

6) Strong dollar is associated with tighter credit conditions Worldwide and emphasize the key role played by US monetary policy in driving global risk premia

7) Even Economies with fully flexible exchange rates are still influenced by US monetary policy, which proves that this is not an effective barrier for Emerging Markets against the growing power of global capital?

14. When capital market frictions and balance sheets, or market depth and money-plus, are included, an expansionary monetary policy should lead to increase in the networth of both borrowers/investors. This feature helps to explain the subsequent expansions in lending and in aggregate demand, or the *Credit Channel of monetary policy*.

Other researchers emphasize more on the *Risk-taking channel of monetary policy*, where financial intermediation plays a key role, and system-wide monetary expansions(e.g. US QE) relax leverage limits and encourage lenders to take additional credit risks.

=> Both of these channels in reality often complement and reinforce each other.

CB QE reduces transactional frictions through a liquidity channel that operates by increasing the opportunity for sellers of those securities targeted by the authorities. Example for this is when the second QE of the Federal Reserve, reduced the liquidity premiums between TIPS yields and inflation swap rates, implying that QE improved market liquidity. But Market liquidity is derivative, whereas funding liquidity is more fundamental.

Onshore and offshore wholesale money markets have become central to the supply of Funding liquidity. Aligned with this is the demand for safe assets. The supply of this liquidity requires collateral as backing and this collateral can be Treasuries, as well as privately produced safe debt.

=> Tirole(2001) presented an asset pricing model that includes a liquidity demand factor. In the model, risk neutral firms willingly pay a Premium on "safe" assets that provide benefits in times of

scarce liquidity. This premium persists because collateralized assets are assumed to be in short supply.

=> One third of total assets are “safe” and around one-third of these are government securities. This implies that the majority of the safe assets are owned by private sector intermediaries, meaning that the system is Procyclical and dependent on collateral values.

= Private sector intermediaries are able to produce additional safe assets (when government ones are missing) and through this channel they can affect asset prices.

This is called the supply-side channel. In this world, the quality mix of collateral in the economy becomes critically important to the supply of liquidity.

=> Too low a stock of Government securities = increase in privately produced collateral and a credit boom = increase in financial fragility

Back in the day, in the retail-based market this was of less concern because the dominant form of safe debt, i.e. demand deposits, was insured by the state. However, the composition of private “safe” assets has since changed with bank deposits going from 80% to 30% in 1950.

15*. The key: Flow of Funds analysis.

=> How funding liquidity affects system-wide liquidity, using a flow of funds analysis

=> Its a way to understand both the credit creation process and the changing position of the interest rate yield curve through the credit cycle.

Flow of Funds accounts are vital tools, because in standard National Income accounting, Income equates with expenditure, but financial assets and debts, and their relationship to current and capital account transactions are all ignored. In contrast, Flow of Funds links income and expenditure flows to their counterpart changes in stocks of assets and liabilities, effectively making sure that all money that's anywhere is accounted for somewhere, showing the stocks and flows between different economic sectors and national and international economies.

=> Government budget constraints are satisfied, and the consequences of runaway government debts are acknowledged.

According Henry Kaufman, flow of funds data capture financial transactions and financial positions of sectors in the economy and:

“...provides perspective and, like double-entry bookkeeping, contains built-in features that help prevent errors in logic ... the amount of funds supplied must equal the amount demanded because it is impossible to lend money unless someone borrows it ... the function of interest rates is to allocate the funds supplied by lenders among those who want to borrow ”

=> The function of Interest rates is to allocate the funds supplied by lenders among those who want to borrow, and this amount of funds MUST equal the amount demanded by borrowers

Furthermore, this analysis allows us to untangle the increasingly convoluted nature of the financial markets. To see who in an economy is proving/drawing what amount of funds in what form, and the financial intermediaries involved in these flows. Financial crises often result from abrupt ‘stops’ in funding liquidity that prevent essential projects and asset holdings from being refinanced. Additionally the different categories of government spending/retail sales/money supply each represents a different use of funds, this can reflect sectoral imbalances and balance sheet mismatches, which is key for assessing financial stability.

16. Setting these ideas about Liquidity into a broader context:

1) Liability management

- 2) Duration
- 3) Global Liquidity
- 4) Geopolitics

Risk matters when liabilities cannot be properly hedged, which, in turn, should encourage a greater demand for “safe” assets. Yet, time shows that there are many dimensions to risk. Most of which arise when Liabilities are not properly matched. Few books on that matter, question the use of volatility as a measure of risk and highlight the implicit absurdity of using Normal distribution to model risk event.

Additionally, MPT and EMH focus on individual securities, not on the behavior of investment crowds or of monetary institutions (such as Central Banks). People go mad in crowds, and crowds form because uncertainty, or unquantifiable risk, being the dominant features of financial markets, forces us to fall back on rules of thumb and consensual thinking. Investment is fundamentally about risk, return and LIQUIDITY, and most currently the most important being the #3.

17. Rates of return on capital are ultimately equalized across economies by capital mobility and the reshuffling of investments. Secular movements in Real interest rates combine these changes in saving and investment behavior with fluctuations in the safety and liquidity properties of safe assets, such as Treasury instruments.

=> Both the falling of industrial profitability and the associated structural shortage of safe assets are key factors behind the long downward slide in World Interest rates.

The more competitors there are for funding, the more are these rates of return equalized.

17.1 China's entry in WTO and her catch-up has had a big impact on marginal returns worldwide and therefore on US/German/Chinese industrial capital.

As new investment projects became less attractive, the western industry flipped into a mode of aggressive cost-cutting across their existing capital in order to maintain reported profits and not be perceived as “failing” and damage reputation further.

=> This cost-cutting can be done by either/both making new investments in high return projects or managing existing businesses.

Incentivised by share option schemes, management's new found devotion to cost-cutting forced plant closures and led to mass job losses, but it raised the average return on American capital.

Before China's entry into WTO, the return on US capital averaged 3.5% in real terms, and topped post-2001 at 4.1%. The gap between marginal and average returns closed dramatically as the effect of Chinese competition pulled down marginal returns (low cost production), while domestic cost-restructuring pushed average returns higher. This narrowing differential can explain the collapse in US capital expenditure. Cash flows consequently rebounded, but corps either hoarded cash/spent it on share buybacks and takeovers, rather than investing into the real economy. This explains the treasuries of the top 6 US companies which equal to 3% of overall US GDP.

= At the same time as the industrial economy was losing out, the financial market was gaining traction.

18. As the financial markets were growing, cash flooded into wholesale money markets. This resulted massive redistribution of cash flows, and thus forced much of the World industry to reorganize:

=> Trashing investment return on many new capital projects, leading on to both “asset-lite” business models and vast debt accumulations

=> Encouraging the US to run a near-permanently loose monetary policy.

This adjustment burden was largely taken by the large and fast growing shadow banks.

The bigger world now, having new supply chains constructed throughout the system have few implication for inflows of liquidity and why its more important than the level of interest rates:

=> The new supply chains restricted cost movements = cost movements or the changes and fluctuations of costs associated with production/distribution/other operations within a business, have been now restricted, due to factors such as increased independence, outsourcing of production and specialization in certain sectors among economies, led by the creation of these chains

=> With these supply chains largely reliant on the US\$, stable exchange rates between countries have become crucial. Fluctuations in these rates might disrupt the cost structures of businesses along these chains

=> Ceiling on the wages and price flexibility = globalization of manufacturing and consumer brands imposed constraints on wages/prices. Probably due to intense competition within these industries and have limited room for adjustments due to market pressure

=> As manufacturing moved to countries with lower labor cost and emerging markets, Western economies have experienced structural unemployment. This made a further gap in the wealth levels between different classes, as the poor lost more(lower wages/higher prices), and the wealthy gained(lower production costs)

=> Increased reliance due to the factors above, to debt for spending = to sustain similar levels of spending, Western economies are now forced to rely on debt to fund themselves. This suggests that borrowing became a key mechanism to maintain levels of consumption and economic activity

=> This debt, or at least much of it is unproductive and, therefore, not so easily paid back.

These swollen debt burdens need to be refinanced. *Defaults occur not necessarily because of insolvency, but far more frequently because of illiquidity.* These refinancing pressures makes balance sheet size and inflows of liquidity much more important than level of interest rates.

=> This liquidity expansion is dependant on the uncertain supply of safe assets, so sudden stops in funding can heighten systemic risks.

=> The loops of the modern financial system depended on sometimes flaky safe assets to help rollover increasing flaki debts creates a negative feedback that highlights the inherent dangers in credit markets.

18.1 Global supply chains are reliant on financial markets for their operation, thus making these markets an integral part of the economic adjustment mechanism, resulting in a heightened Global Liquidity Cycle.

=> These GL shocks are being channeled thru changes in the Exchange Rate, not interest rates

1) Private sector liquidity and cross-border flows largely affect the real exchange rate, while

2) CB liquidity has the more important influence on the nominal exchange rate

Loose monetary policy by the US spilled over through cross-border flows into similarly relaxed local monetary conditions across Emerging markets(Loose Policy by US > Weak \$ > EM having to ease policy to match Exchange rate) and allowed cash to build up in offshore Eurodollar funding markets. The immaturity of these markets amplified both the domestic and ultimately the aggregated international impacts of these cross-border flows on GL. Combined with buoyant savings flows, induced by aging demographics and the “new rich”, these factors encouraged a structural excess demand for “safe assets”, predominantly US Dollar-denominated.

=> Large CICPs increasingly dominate the recycling of the World’s surplus savings and they

demand secure, collateral based short-term instruments.

=> These secure collateral-based short-term instruments are provided by fleet-footed wholesale money markets, which frequently outstrip our traditional and overly-regulated banks in providing vital funding.

=> Thus, Institutional Repos now surpass household bank savings accounts as the most popular financial instruments.

But these Repos require good quality collateral, which is scarce, which is induced by government austerity policies and tight CBs, which disrupts GL and means there is insufficient balance sheet capacity available to rollover and refinance the World's economy's debt. This in itself, heightens the risk of default and pushes the odds of systemic risk up, thus making these "safe assets" even more scarce, further worsening the collateral shortage.

18.2 Governments fail to acknowledge the quality dimension of debt. Their austerity policies, often put in place to balance QEs and ultra-low policy interest rates, have deprived markets of vital Safe Assets.

=> In times of QT, they've reduced Treasury Debt issuance, and thereby, forced the private sector intermediaries to search out new investors and to issue more low-quality debt as a inferior collateral substitute, thereby mismatching liabilities and requiring more frequent refinancing. Or put it simply:

By using austerity policies, Policy makers have tried to avoid "crowding-out" private sector initiatives and simply end up "crowding-in" poor quality private sector debt", making things worse.

^ When they implement these policies in attempt to prevent slowdown and reduced spending in the private sector, they may create conditions that lead to crowding in poor quality private sector debt. This usually occurs due to reducing government debt issuance, thus reducing the "safe asset" supply in the private sector.

This makes rolling the huge amount of World debt both difficult and potentially dangerous. Ironically, the key challenge lies not in the failure of new investments, but the inability to refinance old ones (i.e. Finance current operations). The QE fills this funding gap by expanding the CB balance sheet.

18.3 The beating heart of today's system, or the Refinancing system, is a large and flexible balance sheet that helps to facilitate debt roll overs. Here the capacity of capital, i.e. liquidity, is far more important than the cost of capital, i.e. interest rates.

=> E.g. of this is a home owners that would rather pay the higher interest rate, than face eviction, or the business owner that would rather pay this, than default.

Balance sheet capacity depends upon the existence of sufficient safe assets to act as collateral against the required flow of liquidity.

19. Flow of Funds Framework - we can use this framework to represent liquidity.

Textbook explanation:

Flow of Funds = macroeconomic accounting framework that tracks the flow of funds or financial assets between different sectors of the economy over a specific period.

1) Provides comprehensive overview of how funds are allocated/used, including transactions between households, businesses, governments, and the rest of the world

- 2) *Categorizes financial assets and liabilities into various sectors such as household sector, corporate sector, government sector, financial sector and external sector(rest of the world)*
- 3) *Using this analyzes, policy-makers, economists, and investors can gain insights into the financial health of different sectors, identify trends, assess risks, and formulate appropriate policies or investment strategies*

Using the budget constraint(the expenditure on goods/services cannot exceed income) we can say that the private sector is always in balance, because it can both absorb financial assets and issue financial liabilities, i.e. income is either spent or saved.

Income = spending + net acquisition of financial assets

$$Y_t = C_t + I_t + \text{NAFA}_t = C_t + I_t + \Delta \text{FA}_t - \Delta \text{FL}_t$$

here NAFA_t denotes the net acquisition of financial assets; FA_t is financial assets and FL_t financial liabilities; Y_t represents income, and C_t and I_t denote consumption spending and investment spending, respectively. Δ is the period difference operator applied at time t .

By definition, NAFA(net) equals the gross acquisition of financial assets, FA , less the gross acquisition of financial liabilities, FL . Hence, we can rewrite the budget constraint by moving financial liabilities(borrowings/debt issuance), to the left-hand side of the expression, or:

Income + gross acquisition of financial liabilities = spending + gross acquisition of financial assets

$$Y_t + \Delta \text{FL}_t = C_t + I_t + \Delta \text{FA}_t$$

Because savings are defined as income less consumption, by subtracting consumption spending, C_t , from both sides gives:

Saving + gross acquisition of financial liabilities = fixed investment + gross acquisition of financial assets

$$S_t + \Delta \text{FL}_t = I_t + \Delta \text{FA}_t$$

Now we can define liquidity as the sum of Savings and “liquid” financial liabilities. We ignore “illiquid”

liabilities, for now at least:

Liquidity = fixed investment + gross acquisition of financial assets

$$L_t = S_t + \Delta FL_t = I_t + \Delta FA_t$$

Flow of funds budget constraint has now been rewritten in terms of the Sources* and Uses* of funds. L_t = Liquidity.

This shows that the Flow of liquidity can move independently of savings and that it is not the same thing as money. Money on the other hand, being defined as bank deposits, is classified under financial assets. In addition to this, because of its frequently large credit component and its dependence on collateral, liquidity is both endogenous and highly procyclical.

The changes in financial liabilities and financial assets can be broken into their subcomponents:

$$\begin{aligned}\Delta FL_t &= \Delta MB_t + \Delta BSC_t \\ \Delta FA_t &= A_t \cdot \Delta P_t + \Delta CH_t = I_{f,t} + \Delta CH_t\end{aligned}$$

where MB_t is Central Bank Money, but it can also include what we have called the *shadow monetary base*; BSC_t represents bank and shadow bank credit; CH_t denotes cash holdings, including bank deposits; S_t is total savings of households, corporations and foreigners, and A_t is the number of securities or assets in existence.

Defining real (I_t) and financial investments ($I_{f,t}$) as:

$$I_t = P_t \cdot \Delta A_t$$

We can rewrite this fundamental relationship as:

$$\begin{aligned}L_t &= S_t + \Delta MB_t + \Delta BSC_t = \Delta (P_{f,t} \cdot A_t) \\ &+ \Delta CH_t = I_t + I_{f,t} + \Delta CH_t\end{aligned}$$

Left side describes the Sources* of funds and the right, the Uses*. The middle represents the overall change in wealth, or in other words, Increases in liquidity(credit and savings), finance increases in wealth, which comprise changes in real investment, financial investment and cash deposits.

We can further subdivide these sources:

1) Public sector liquidity = changes in the Central Bank monetary base (CBL = changeMB)

2) Private sector liquidity = savings plus new credit extended by banks and shadow banks(PSL = S + changeBSC)

These divisions are similar to the concepts of outside/inside money, respectively, that appear in the literature.

(1) Let's assume that private sector liquidity moves positively with the profitability of industrial capital(R).

- (2) This statement implies that policy-makers increase the supply of base money in order to reduce short-term interest rates(r) in-line with their policy rate targets.
- (3) The latter assumption suggests that Savings expand with economic activity and the pool of profits, and that credit providers are more willing to make new loans when profitability is good.

This dynamic shows that, Forex markets, which are incentivised by average available returns, follow the path of private sector liquidity less Central Bank liquidity($R+r$): in other words, the mix of liquidity =

$$\text{Private sector liquidity} - \text{Central bank liquidity} = \text{mix of liquidity}$$

Alongside, domestic financial markets, which are influenced by the risk premia, such as the term spread and credit spread($R - r$) are affected more by the overall flow Central Bank and private sector liquidity:

$$\text{Central bank liquidity} + \text{Private sector liquidity} = \text{overall flow}$$

In short:

- 1) Risk premia depend on the aggregate quantity of liquidity
- 2) Exchange rates depend on the quality mix of liquidity

19.1 Alternative decomposition, or deriving the liquidity framework by recasting it in term of the Standard Quantity equation of money

Textbook explanation:

Standard Quantity Equation of money = or also known as the equation of exchange, is a fundamental equation in monetary economics that expresses the relationship between the money supply, the velocity of money, the price level, and real output in an economy

1) Equation is typically represented as $MV = PQ$, where:

- M - money supply
- V - velocity of money (rate at which money changes hands)
- P - price level
- Q - quantity of goods/services produced

2) This equation suggests that the total spending in an economy (MV) is equal to the value of transactions (PQ). It implies that changes in the money supply, velocity, or real output can influence price level in the economy

3) Useful tool for analyzing the factors affecting inflation, economic growth, and the effectiveness of monetary policy interventions

We refer to liquidity analysis as the “quality” theory simply because velocity of money is always changing due to regulation, innovation or changes in the value of money. High-powered money (MB) times its velocity (v) must equal the value of transactions price(p) times volume (T)

$$MB_t \cdot v_t = P_t \cdot T_t$$

In terms of period-on-period changes:

$$\Delta(MB_t \cdot v_t) = \Delta(P_t \cdot T_t)$$

Expanding the right-hand side:

$$\Delta(P_t \cdot T_t) = \Delta GDP_t + A_t \cdot \Delta P_{f,t} + \Delta BD_t$$

where GDP is economic activity; A is the stock of assets; P_f asset prices and BD bank deposits. Since we can define $\Delta GDP = I - S$ where I denotes

Financial liquidity can also be measured by $L - \text{real investment (I)}$. This quantifies the flow of funds into the financial asset economy, comprised by private sector savings (households savings and corporate profits) changes in the supply of high-powered money and changes in its velocity of circulation.

The change in velocity effectively measures the impact of credit. Velocity is not constant, rather it fluctuates significantly thru the business cycle, and typically sees a strong upward trend over time because of financial innovation. It is the asset economy that tends to absorb and cushion most of these liquidity swings.

20. While distinguishing the difference between the real economy and financial economy, we must not permanently separate the two, due to their complex interrelationship, with events in both affecting one another. *But the financial economy being the more important one. (feeds into our liquidity-driven market view)*

=> John M. Keynes describes the real economy as "The Industrial Circuit of money" -

Keynes argues that economic activity is driven by the circulation of money through various sectors of the economy (go back to the Flow of Funds framework section). The basic idea is that spending by one economic agent becomes income for another, creating a circular flow of money. This flow consists of several key components:

1. *Consumption: Households spend money on goods and services produced by firms.*
2. *Investment: Firms invest in capital goods and other productive assets to expand production capacity.*

3. *Government spending: The government purchases goods and services and provides transfer payments like social welfare benefits.*
4. *Exports and imports: International trade involves the exchange of goods and services between countries, affecting the flow of money across borders.*

Keynes emphasizes the importance of aggregate demand, which is the total spending in an economy, in determining the level of economic activity and employment. Changes in any component of the circular flow, such as changes in consumption or investment, can have multiplier effects on overall economic output.

21.1 Nominal Interest rates are strongly affected by Risk and Term premia, which are governed both by future expectations and current beliefs, as well as by access to liquidity, which is a gross flow or balance sheet concept. *Interest rates, as well as Financial asset prices, are determined in financial markets by decisions about Gross, rather than Net, funding.

*In the modern capital economy, investment depends on the Total Pool of Liquidity and not just savings. In other words, thinking in terms of the Flow Of Funds Framework, net savings(i.e. Savings less capital expenditure, $S - I$) represents the net NAFA(net acquisition of financial assets), and it is only one small component of overall funding, i.e. liquidity.

=> NAFA, in turn, comprises the difference between the change in Financial Asset holdings and the increase/decrease in financial liabilities. There can be many ways of arriving at any given net change, which makes it not as important as gross changes

=> On the other hand, Gross balance sheet changes(or the Gross AFA) are independent of the net savings positions and by implication of what happens in the real economy.

These dynamics mentioned above are described elsewhere by Raymond Goldsmith (1985) as “financial deepening” and they explain his belief that the so-called financial interrelations ratio rises over time.

=> This ratio is a metric/index used by Goldsmith to quantify the extent of financial deepening within an economy. It captures the various aspects of financial development, such as the size of financial institutions relative to the overall economy, the breadth and depth of financial markets, the diversity of financial products and services available, and the efficiency of financial intermediation.

He believed that as economies progress, financial deepening plays a crucial role in facilitating economic growth and development. It enables more efficient allocation of capital, mobilization of savings, risk management, and provision of financial services to support investment and entrepreneurship. This highlights the importance of a well-functioning financial system in support economic advancement and improving living standards(i.e. Financial markets push industrial markets)

21.2 Similar observations apply to current account balances and the underlying movements in gross capital inflows and gross capital outflows. A narrow focus on net imbalances too easily concludes that Emerging markets(EM) drive Global Liquidity(with their net savings surpluses). However, the broader concept of gross flows shows that a major force has been the huge increase in foreign liabilities of safe assets and credit issued by the major developed economies, as when global money center banks feverishly increased their lending ahead of the GFC and investors from EM piled into US treasuries.

=>It follows that each asset/liability mix likely has a different implication for financial assets. At the same time Cheap Chinese imports, reinforces that idea that inflation is to a large extent driven by costs, rather than by monetary factors.

=> Consequently, real interest rates must be affected by these same monetary shifts and the implied fluctuations in risk and term premia.

Financial history tends to show that Short-Term policy interest rates follow rather than lead long-term rates, and, in turn, policy rates typically precede inflation and what's more, they often act in the same direction.

21.3 Flow of Funds data vs. National Income Accounts(such as GDP/consumer spending)

=> NIA are measures of expenditure that track how money is spent, but they DO NOT explain how spending is financed and therefore you cant know if its sustainable or not

=> On the other hand, Flow Of Funds statistics give us a far more comprehensive picture of financing activity by measuring the net acquisition of financial assets by each economic sector.

Flow of Funds, or the financial flows accumulate and they are ultimately reflecting in rising stocks of financial assets and liabilities in sectoral balance sheets, while Spending Flows(NIA), once spent, disappear. Such high debt/leverage ratios may consequently reduce in quantity/extent new flows.

22. Investment spending is determined by liquidity, not just by savings. This means we need to bring Credit in the equation and think more broadly in flow of funds terms. It requires adding the financial circuit of money to our models. And consider how the balance between the overall Sources* and Uses* of funds are maintained and restored.

=> This tells us that *Interest Rates and other financial asset prices are determined more by gross flows, i.e. the entire financial sector balance sheet, and not solely by net flows.*

=> *While any monetary imbalances will express themselves thru the price of money, contrary to conventional thinking, this is NOT the interest rate.*

Like every other price it should measure what money can buy, i.e. in terms of trade/exchange rate.

=>Or more simply, interest rate can be better thought of as the Premium paid on money when it is borrowed, and these premia vary by the time horizon and according to the riskiness of the borrower, which again depend on balance sheet factors.

22.1 Recognizing that Liquidity = sum of savings and credit, there are four adjustments outcomes following the positive liquidity shock:

- 1) Greater Real Investment(both can be productive/unproductive schemes)
- 2) Rising value of financial assets
- 3) Falling value of financial liabilities
- 4) Lower national savings

This is the most feasible adjustment of an EM economy, that has abundance in investment opportunities, but suffers comparative shortage of domestic savings, and less likely path for a mature Western economy, and more liquidity is likely to inflate asset values in these cases.

=> These adjustments are more complex than the traditional narrative suggests because they involve financial markets and its far from clear that these adjustments will either restore balance or act quickly.

Eg: When Liquidity exceeds capital spending ($L > I$), the private sector can accumulate financial assets, i.e it likely means that the change in value of their financial assets exceeds the change in value of their

financial liabilities. In a world where collateral stands as an important factor backing new credit supply, this net increase in assets values may, in turn, induce a further expansion in financial liabilities, i.e. credit.

=> Financial imbalances amplify the initial shocks, from which it may take years to restore equilibrium.

22.2 This inclusion of the financial circuit complicates the adjustment greatly, because Liquidity has two dimensions - Quantitative and Qualitative

1) Qualitative dimension can be thought of as “moneyness” and this tends to act procyclically to raise the effective quantity of liquidity. Or put it in other words, as the cycle extends the effective supply of liquidity naturally expands as more assets are used as money, or vice-versa, i.e. amplifies the initial shocks.

- can be seen as improving risk appetite(permits greater leverage)

- and from enhanced collateral values(increases the stock of high-powered money)

=> High-powered monies are assets that can be leveraged, and they include both traditional reserves held at the CB, as well as the collateral used to borrow from money markets and the extra cash available to borrow from offshore money markets.

=> the stock of High-powered monies consist of A) Central Bank reserve money + B) shadow monetary base money.

This is fed by the Eurodollar markets and by the increasing substitution of poorer quality private sector collateral for higher quality government bonds, due to the shortage of these Government bonds. As a result, the volume of GL is increasingly procyclical and fragile, resulting in expanding, but at the same time more volatile financial system.

22.3 As additional liquidity is channeled into the financial circuit, Default risks decline (1), risk premia narrows(2) and the term premia associated with “safe” assets increase in size as demand for them drops.

=> This boosts equity markets, improving the climate for capital-raising/risk-taking, and thru a steepening interest rate yield curve bank profit margins expand, which incentivises greater bank lending.

Money borrowed in a boom/economic upswing, i.e. means of purchase, is qualitatively different from money borrowed in a slump/economic downswing, i.e. means of settlement.

=> Money borrowed in a boom - used to expand the circuits of money

=> In a slump - used to close the circuits of money

In this regard, CB money is unique, due to the fact that it always takes both forms. Private sector on the other hand fluctuates in size, in part, because it's moneyness changes(due to economic cycle), i.e. its ability to serve as settlement. At these times, overall volume of liquidity may be enhanced by more CB money. While this is a national legal tender, it is not an international legal tender and extra supplies will likely cause the exchange rate to drop.

This explains why increases in both Private/CB liquidity cause national risk premia to narrow(more liquidity, less systemic risk, higher collateral values, etc.) and therefore, the antithesis “safe” asset premia to notionally widen. Furthermore, differential changes in private/CB liquidity cause exchange rates to fluctuate. Thus:

- 1) Strong Private sector liquidity and weak CB liquidity = can strengthen national currencies, and
- 2) Weak Private sector and strong CB = can weaken national currencies

The intuition behind these two points, comes from thinking about the Return on Industrial Capital and the policy interest rate. Let assume that private sector cash flow is positively correlated to the underlying return on industrial capital(say, R) and central bank liquidity is negatively associated with the policy interest rate(say, r). Then, the yield curve slope should be determined by the spread between industrial returns and short-term interest rates, or $R - r$. Similarly, the exchange rate is related to the size of the average returns available from industry and money markets (i.e. $R + r$). This is the Exchange Rate channel.

23. Expanding Further on The Exchange rate channel

=> Textbook understanding of Exchange Rates are that they are supposed to Restore External Balance, because an Economy experiencing an appreciating currency should expect to suffer lower net exports.

Yet in reality, this is rarely the case and particularly with Emerging Market economies.

=> Rather than dampening economic activity, periods of strong currency appreciation often coincide with similarly strong cross-border capital inflows and buoyant business activity.

=> In practice, exchange rates influence Economies thru both real/financial channels.

A net export channel is embedded in standard open-economy macro models, but Exchange Rate fluctuations and cross-border capital flows also influence the economy thru changes in the composition and size of its external balance sheet, or thru the *Valuation channel of adjustment*. This channel works alongside the standard trade channel in order to achieve external balance, but its the dominant part or $\frac{1}{3}$ of the adjustment coming from these financial channels, compared to 41% coming from trade.

23.1 To better understand, we should engage in Flow of funds analysis yet again.

=>Dislocations in the flow of funds ultimately affect the real economy thru The Real Exchange rate.

^Real exchange rate expresses the real purchasing power. You could think of it as being determined by the relative productivity performance between two economies.

Hence, faster-growing economies should have a stronger Real Exchange Rates. Thru the help of Free trade, Capital flows and technology transfers, other newly industrialized economies(such as China), enjoy relatively faster productivity growth than America.

=> Real Exchange Rate can be calculated by adjusting the nominal exchange rate for relative price movements, but what comprises these baskets of prices is less straightforward.

=> CBC personally, includes Trade/Non-Traded goods and services prices, wages, and asset prices.

The degree of flexibility exhibited by these various price types differs considerably, but in a world economy denominated by large businesses, asset prices are the most flexible and trade goods/services prices among the least flexible. There is supporting evidence that shows how prices tend to be rigid in the currency in which they are invoiced.

So in a world basically denominated in Dollars, means that the sensitivity of the business activity is determined by the US exchange rate.

=> Global Value Chains(GVC) use US dollars extensively to finance their inventories and their US dollar needs grow disproportionately as these supply chains lengthen.

=> This suggests that the wider role of the dollar in invoicing results in less price flexibility and greater adjustment through profit margins, supply and trade volumes.

=> A generalized 1% US dollar appreciation leads to a 0.6-0.8% decline in the volume of total World Trade over a one-year period.

=> Additionally, due to the large use of dollars, or the deeper dollarisation of domestic bank deposits forces the national Central Bank to build up precautionary dollar reserves in order to protect the financial system from external shocks

23.2 Liquidity shocks can come in both externally and internally:

=> Externally = thru net capital inflows

=> Internally = thru the effects of faster productivity growth on domestic profits

They initially impact the private sector liquidity and thereby trigger changes to the real exchange rate.

=> Favorable liquidity shock tends to increase the flow of private sector liquidity = appreciation in the real exchange rate, and vice-versa

The division between a change in the real vs nominal exchange rate, but when policy-makers inject more/less liquidity, they can affect the split.

=> If the shocks are channeled from the real exchange rate adjustment through to the nominal Exchange Rate, larger cash injections by the CB will slow down the appreciation and force more adjustment on to goods prices and wages. These actions ultimately fuel rising/falling financial asset prices, because they are easier to move, then other "sticky" prices

Under the prevailing globalization regime, policy-makers can therefore effectively choose between the level of asset prices and the nominal Exchange rate.

So, a key distinction between 1)export-focussed economies(JPY/GERMANY/CNY) and 2)Large banking sectors and deep financialised economies(UK/US) is that:

1) They favor stability vs. the Dollar

2) They aim at preserving or even enhancing the collateral values of domestic assets and consequently are more willing to accept nominal exchange rate weakness.

You can see point one in today's time, where China is trying to stabilize her Exchange Rate but risking deflationary pressures due the Yen depreciation against the dollar, and the dollar appreciation overall. Point two is easy to see as well. US nominal devaluation policy has a long history, having been used successfully to claw out the economy from the 1930s Depression. ***"Deliberately devaluing money primarily against commodities, rather than assets, in the 1930s can be understood because agriculture was then far more important to the US economy than it is today. Nearly a century on, the modern credit-based economy has a greater need to maintain the value of its collateral."***

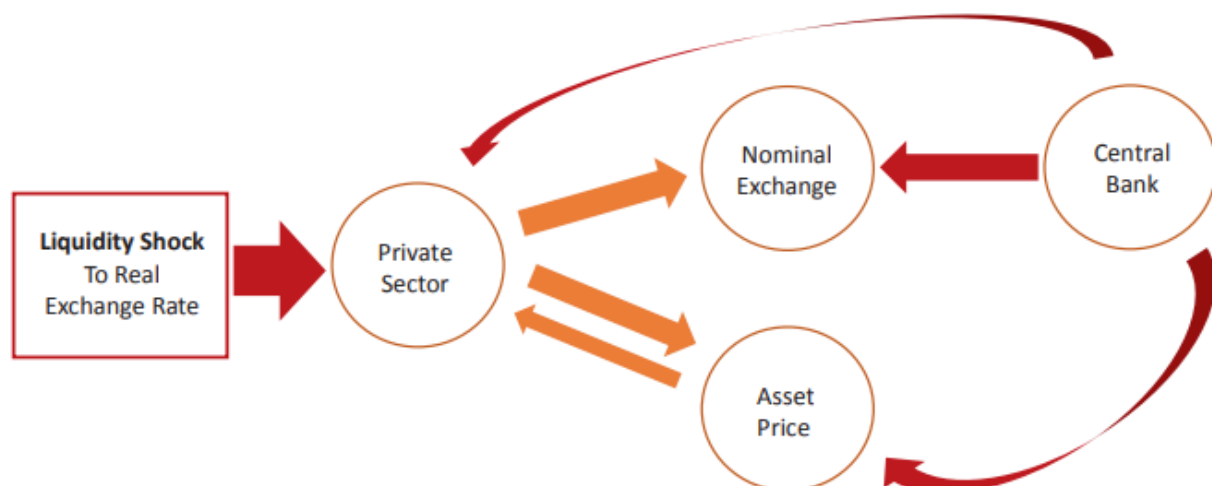


Fig. 5.2 Schematic diagram showing real exchange rate adjustment

The financial adjustment mechanism: Initial Liquidity shocks strengthens private sector liquidity, which puts pressure on Asset prices and the Nominal exchange rate. Moving to the other side of the diagram, the precise division between changes in Asset Prices and Nominal ERs depends on the scale of the subsequent Central bank intervention. By changing its Balance sheet, the Central bank can fuel private sector liquidity, either directly, or easing the funding terms, or indirectly, through the effect that rising collateral values have in boosting the willingness of credit providers to lend more. This diagram incorporates a number of positive-feedback effects that explain the liquidity cycle and asset bubbles.

23.3 The precise transmission (fig 5.2) starts from an increase in productivity or capital flows that put pressure on the real exchange rate. Under a targeted nominal exchange rate regime, assuming that the price levels of traded goods are set internationally and are, therefore, sticky, the bulk of the economic adjustment comes mainly through service sector prices and notably asset prices (the lower path). Therefore economies with strong productivity growth and net capital inflows, often enjoy rising asset prices, especially when nominal exchange rates are stable. And especially when appreciating assets tend to attract even more capital, these moves can be amplified (shown by the feedback between Private sector and Asset price bubbles in the diagram).

Eg. A great example of the dynamic will be a diagram like this drawn for America alongside a China equivalent.

1) A negative productivity shock to the US, (possibly from a shift in market share towards China businesses) leads to downward pressure on the US real exchange rate (equal to upward pressure on China RMB exchange rate).

2) They may be met by an easier monetary stance by the Fed in order to ensure stable asset prices, hence stable collateral values.

= 1) The result will be a Weaker US dollar.

2) As the nominal exchange rate devalues thereafter, surplus liquidity spills into offshore funding and investment markets.

3) In addition to this, a weaker US dollar encourages both more cross-border lending and boosts global asset prices.

Together, both effects tend to encourage still greater cross-border capital flows.

In the meantime, the Chinese authorities will likely resist downward pressure on the US dollar ER vs. the Yuan by monetising capital inflows and any new export surpluses.

=> The resulting liquidity injection underpin rising domestic Chinese asset prices, and may, in turn spill to other similarly positioned EM economies, which quickly follow suit and amplify the initial reaction even further by monetising foreign inflows.

= Thus the initial reaction from the US monetary policy easing gets quickly amplified Worldwide.

23.4 Thus, understanding the Global Liquidity cycle may simply come down to interpreting the motives and actions of the US Fed Reserve and the PBoC, as well as the separate effect that US dollar movements have on boosting cross-border capital flows.

These two Central Banks also indirectly exercise control over these capital flows

1) Because nominal US dollar movements depend to a large extent on their joint policy actions

2) Because the ultimate direction of cross-border capital flows is itself often dictated by the tempo of the Chinese Economy, which itself is determined by PBoC monetary policy.

Through this dynamic, whenever PBoC matches the US Fed actions, the Fed enjoys huge leverage over Global Liquidity conditions.

24. Furthermore, if we separate the liquidity in the US between the Central Bank component and a private sector component, we can see that Private sector Liquidity is good for the exchange, whereas the supply of the Central Bank is bad for the exchange rate. There is also statistical evidence for this.

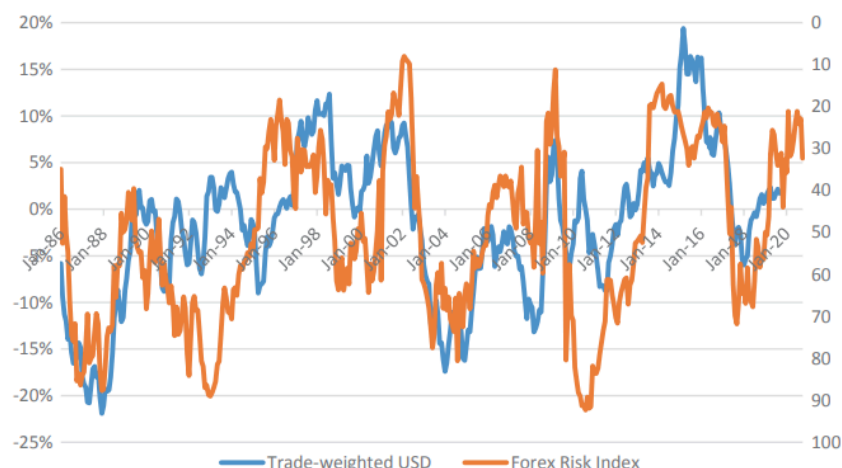


Fig. 5.4 US forex risk index (advanced 12-months) and US trade-weighted exchange rate (percentage deviations from 3-year trend), 1986–2019 (indexes 0–100) (Source *CrossBorder Capital*)

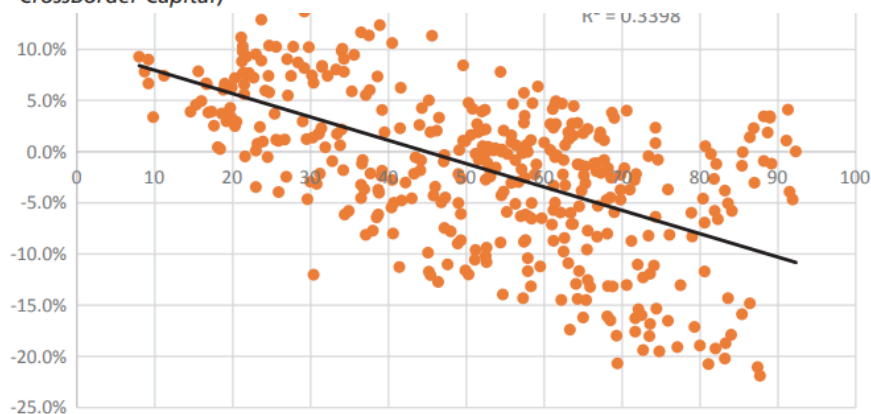


Fig. 5.5 Scatter diagram of US forex risk index (advanced by 12-months) and trade-weighted US dollar, 1986–2019 (Source *CrossBorder Capital*)

=> Additionally, you can look at events that have occurred in the past as evidence. Such as the GFC, which were associated with excessive Fed liquidity supply, and the subsequent dollar weakness. Or the 2015s when America's tech giants were strongly cash generative, thus leading on to a rising Dollar. Such conclusions apply to other currencies, even Emerging Market units.

25. There are generally two types of liquidity:

- 1) Funding liquidity = measure of cash flow, and
- 2) Market Liquidity = measure of market depth

Whereas, Market Liquidity is linked to the price and size embodied in bid-ask spreads, and Funding Liquidity can be gauged from the quantity and the quality of the sources of new liquidity, i.e. Access to means of Payment or cash. In practice, this is measured by the amount of cash on-hand + ability to borrow more cash from banking and credit markets.

"Liquidity: A Measure of Funding Liquidity can be split into its private and public components. Public liquidity is measured by the short-term liabilities of the Central Bank and the government e.g. cash in circulation, bank reserves, reverse repos, Treasury bills. Private sector liquidity consists of equivalent short-term private liabilities, e.g. bank and shadow bank credits, repos and commercial bills."

25. Liquidity has both qualitative/quantitative dimensions as well as private/public sector ones.

A) Liquidity is global and not just national, unlike the popular M2, which measures money supply on an economy

B) Its used in wholesale financial markets, as well is in retail markets, eg. it embraces the entire private sector and not just high street banks

C) It includes access to credit as well as to savings deposits

D) And, since it is measuring funding(the refinancing of existing positions), and not just new credit, it is best measured by gross flows, i.e. changes in the entire balance sheet capacity of the private+public sector, and not just net flows. M2 serves just as one part of this overall liquidity picture.

25.1 With the rise of use in Repos, commercial paper and Eurodollars, the traditional M2 measure is far less accurate, missing an important part of the whole picture.

=> M2 is comprised of notes+coins+insured deposits of households, summing up to 15\$T~

This misses out on the broad picture, namely the Uninsured claims of institutional money managers, corporations, forex reserves managers, as well as Eurodollar balances, summing up to 26\$T~ which is almost double the size. You easily see the difference in information.

25.2 Academics argue that Central Banks can be circumvented by the Treasury Department simply by altering its funding mix between short-term/long-term debt, but this thinking ignores the subtle role played by Central banks in setting the terms for credit and controlling leverage.

During financial crises, Central Bank money is deemed high quality(unambiguous means of settlement for debts), i.e. the quality mix of the liquidity components matters. This feeds into why thinking in terms of Quality Theory of money is more important than the popular Quantity theory of Money(Focus on M0/1/2 supply). *The changing importance attached to public/private sector liquidity through the business cycle is a good example of fluctuations in this quality dimension.*

25.3 The quality of liquidity is governed by the substitutability between financial instruments(coins,

banknotes, bank demand deposits, bank credit, etc.)

=> Range of "Near Monies" = time deposits, commercial paper, repos, T bills, shorter-dated Treasury securities, cash surrender values of life insurance policies, shares in savings and loan associations, saving bonds, building society deposits, postal saving deposits, savings in MMFs and most other credit instruments issued by the financial sector.

These gen included in the definition of liquidity(of CBC) when:

1) Prices are relatively stable, and

2) Easily convertible into legal tender(I.e. Liquid in terms of market depth)

This (above) means that each asset's liquidity is determined by the Speed Of Conversion into Means Of Settlement at full value and this, in turn, both owes something to the asset's duration and something to its credit quality. This means that liquidity strictly has two quality dimensions, not one:

A) Low Credit risk, and

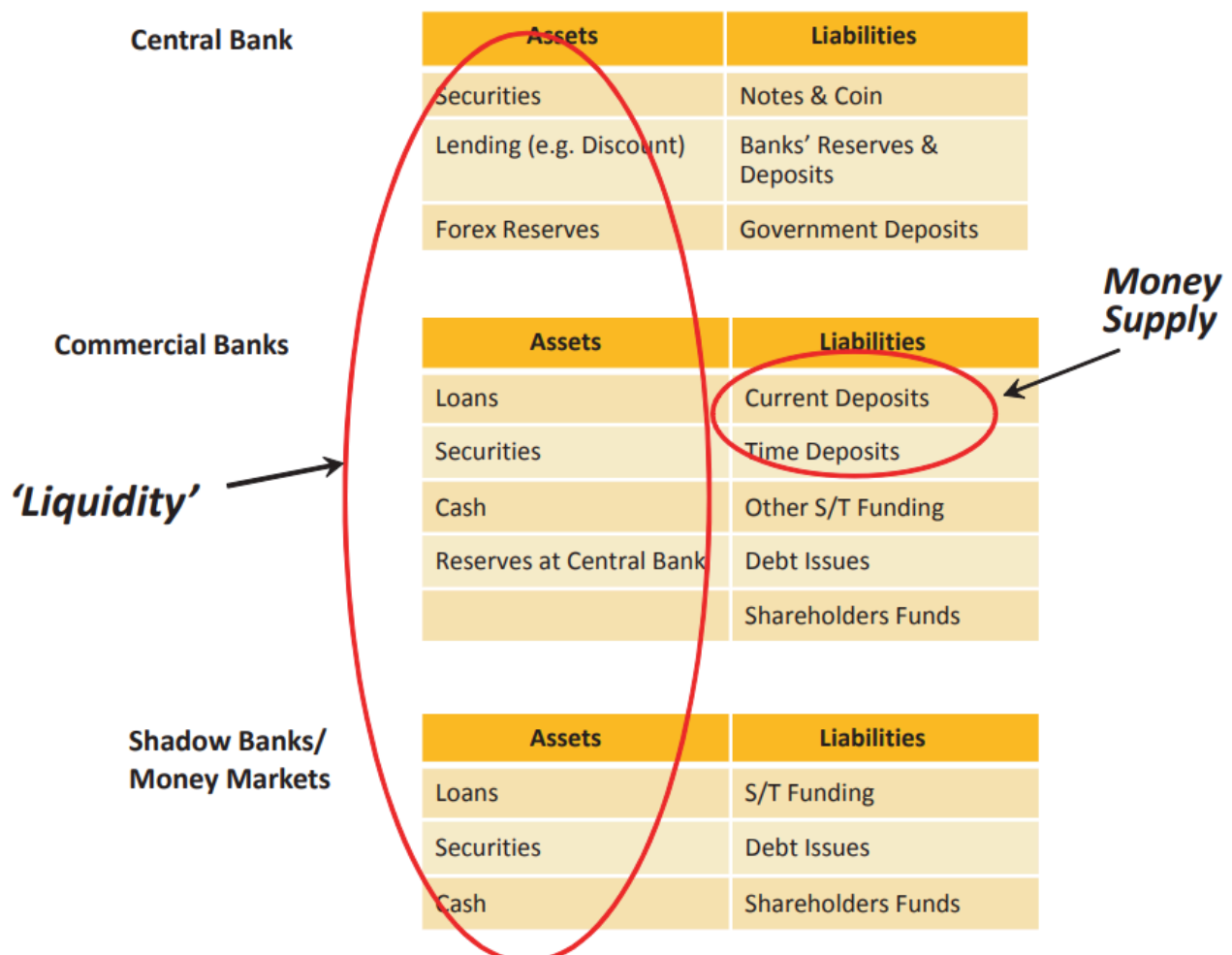
B) Low duration risk

In practice, if an asset has both of these dimensions, the asset can be equated with being "safe".

Example for this: a US dollar bill has zero duration risk and at the same time zero credit risk and serves as legal tender(cash for residents). A British Gov. gilt-edged bond(similar to US Treasuries) has near-zero credit risk, but depending on its maturity it has non-zero duration risk. Because asset duration should not always be thought of as an absolute concept, but relative to the duration of liabilities, duration risk varies by institution.

Hence, a traditional bank bank takes on sizable duration risk given the amount of zero duration liabilities(retail retail deposits) they hold. However, a pension fund, which faces liabilities(pensions lmao), on average at about 10 years, should measure its duration risk against a default-free 10-year bond. Thus, this explains why the 10-year T-bill is the canonical safe asset for many investors.

25.4 Breakdown of US liquidity between traditional banks and the five main types of Shadow banking(Excluding Repos)



Overall US Liquidity = 26\$T, more than both US GDP(20\$T) and traditional US M2(15\$T), with shadow banking making up just under half(changing over the cycles)

Shadow banking are banking activities that are either off-balance sheet or outside the scope of the traditional bank regulators. They went from providing less than 40% of total liquidity in the 1970s to 60% in the early 2000s, before retreating back to settle at around half of total US private liquidity.

One of the largest components in Shadow Banking in America is the US Government Sponsored Enterprises(GSEs):

- FNMA = Fed. National Mortgage Association aka Fannie Mae
- FHLMC = Fed. Home Loan Mortgage Corp aka. Freddie Mac

These institutions provide access to funding for smaller banks, savings and loans, and mortgage companies that grant housing finance loans. Both Fannie Mae/Freddie Mac buy mortgages from lenders, which either hold as investments or repackage into MBS that may be sold to others. In turn, lenders use the cash raised from selling to GSEs to engage in further mortgage lending.

= This is one example of securitisation, which is the other main type of shadow banking activity. Generally, the securitisation of other loan types is often undertaken by the major **money-center banks** themselves, often thru off-balance sheet entities under their umbrella. **Finance houses(money providers)** on the other hand, focus more on hire purchase(buying an asset thru an initial downpayment, called installment, and repaying the balance of the price plus interest over a period of

time, i.e. rent to own) and consumer credit markets. Commercial paper(including asset-backed instruments), hit a peak ahead of the GFC, but has declined in importance thereafter.

25.5 Traditional Banks = highly leveraged entities(typical around 10 times equity, depending on Required Reserves), which undertake substantial maturity risk, due to the fact that they borrow short-term and lend long-term. This is measured by the duration of assets and liabilities, which for US banks is around 4 years.

Duration on the other hand, also serves as a rough measure of their interest rate sensitivity, so that each 100 bps rise in interest rates across the term structure will cause liabilities to increase by 4% (=4 x 100 bps) relative to the value of assets. For these banks that are leveraged 10:1, their equity return could collapse by some 40%. In short, banks are highly sensitive to interest rates due to their higher leverage and greater exposure to maturity transformation risk(Short-term => Long-term lending), many shadow banks are even more exposed to interest rates.

25.6 Using their broad classification, World shadow banking now exceeds 210\$T, more than 2 ½ times World GDP(CBC estimates, while alternatively, using a narrow definition covering institutions deemed to be exposed to the most vulnerable business strategies, high risk shadow banking currently totals to about 60\$T.

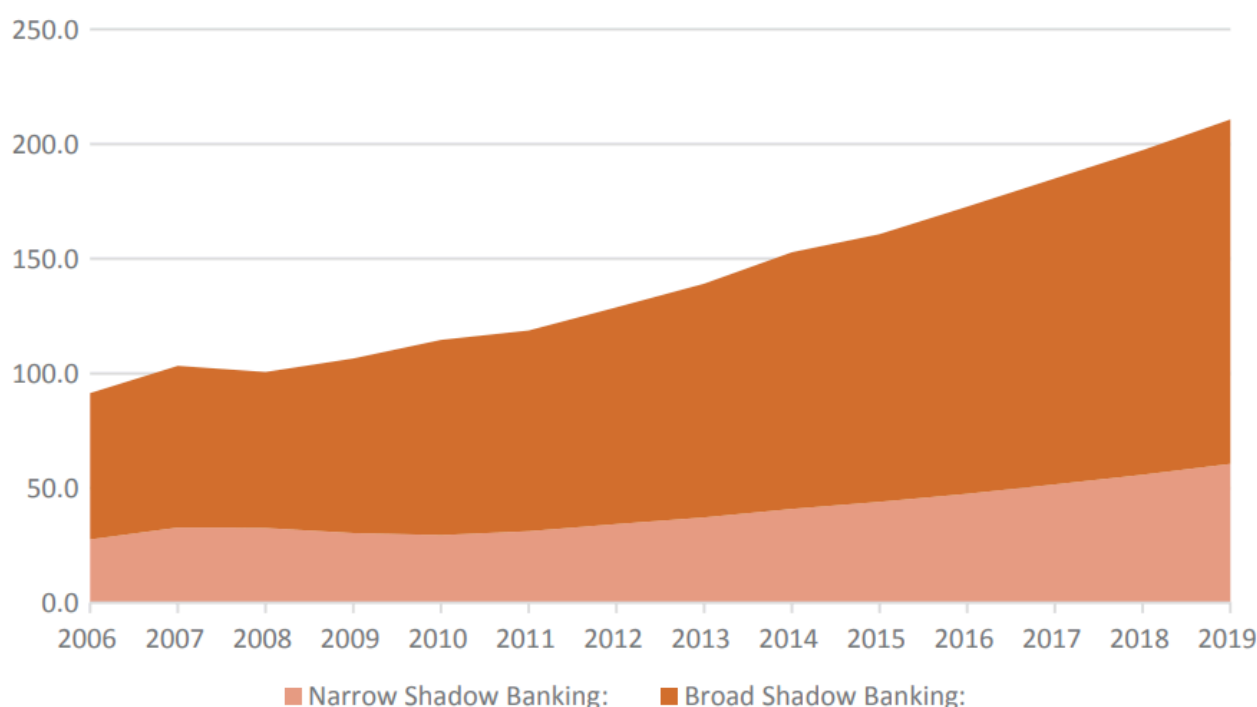


Fig. 6.4 World shadow banking—broad and narrow measures, 2006–2019 (US\$ in trillions) (Source *CrossBorder Capital*, FSB)

The Financial Stability Board or the FSB has been tracking these shadow banks since the GFC estimating that the Stock of World Financial assets including some double counting(important for financial stability monitoring) because of overlapping exposures, summing up to 450\$T(for 2022), whereas CBC measure stands at around 225\$T(post-2017), based purely on primary assets and excluding repackaged instruments like mutual funds. The FSB(post-2017 numbers) includes:

insurance companies and captive insurance (US\$36 trillion), pension funds (US\$38 trillion), investment funds (US\$46 trillion), money lenders, broker-dealers (US\$10 trillion), money market mutual funds (US\$6 trillion), hedge funds (US\$5 trillion), structured finance vehicles (US\$5 trillion), trust companies (US\$5 trillion), finance companies (US\$5 trillion), real estate investment trusts and funds (US\$2½ trillion) and central counterparties (US\$1 trillion).

They also classify high-risk (narrow) shadow banking into categories by asserting their exposures to:

- A) Liquidity transformation risk
- B) Credit risk
- C) Maturity risk
- D) Leverage

They correspond to (respectively):

- A)) Risk of bank runs
- B)) Dependence on short-term funding
- C)) Intermediaries that provide short-term funding
- D)) Credit Guarantors
- E)) Securitisation exposed to short-term funding

Within this total, or the 60\$T pool of high-risk functions or shadow banking has increased by 120% since 2006, assets of institutions exposed to bank runs have more than tripled since the GFC, largely because they are taking more maturity risk and greater leverage.

Table 6.3 High-risk (narrow) shadow banking by major risk type, 2006–2019 (US\$ in trillions)

US\$ trillions	By risk type						
	Total	RR	STC	ISTC	CG	SFI	Other
2006	27.6	11.5	3.1	6.9	0.1	5.5	0.6
2007	32.8	14.0	3.3	7.8	0.1	6.7	0.9
2008	32.6	14.2	3.6	6.2	0.1	6.8	1.7
2009	30.4	14.9	3.3	4.0	0.2	6.6	1.3
2010	29.5	15.9	3.4	3.5	0.2	5.2	1.2
2011	31.2	18.1	3.4	3.7	0.2	4.4	1.3
2012	34.3	21.7	2.9	3.8	0.2	4.3	1.3
2013	37.2	24.7	2.9	3.9	0.2	4.3	1.2
2014	40.9	27.7	3.1	4.3	0.2	4.4	1.3
2015	44.0	30.6	3.1	4.1	0.2	4.5	1.5
2016	47.5	33.6	3.3	4.0	0.2	4.5	1.9
2017	51.6	36.7	3.5	4.2	0.2	5.0	2.0
2018	55.8	40.5	3.6	4.2	0.2	5.2	2.1
2019	60.6	44.7	3.7	4.3	0.2	5.5	2.2
% change 2006–19	119.4	288.4	19.4	–37.7	100.0	0.0	266.7

RR—risk of bank run; STC—dependency on short-term credit; ISTC intermediation of short-term credit; CG—credit guarantors; SFI—securitisation of short-term financial credit

Source FSB, *CrossBorder Capital*

26. Intermediation Chains and growth in Wholesale money

The financial world has moved from new credit provision to gross credit provision, i.e. moved from New financing to Refinancing. Credit markets have become both more international/interconnected, spanned by complex intermediation chains and financed by the increasing use of market-based collateral, since there is no more trust between parties since the GFC.

According to the IMF, the shadow banking sector is responsible for some two-thirds of this gross funding, but accounts for less than 15% of new credit provision.

=> What shadow banks essentially do is to transform traditional bank assets and liabilities and to refinance them in longer and more complex intermediation chains (A lends to B who lends to C, etc.).

Part of the reason why you are missing the whole picture when looking at traditional metrics of financial health or trying to measure them by watching only the different deposits in metrics like Money Supply.

=> In doing this they provide alternative stores of value (ABS) to institutional investors that do not want to hold all of their liquid assets as (Uninsured) demand deposits.

=> Therefore, shadow banks largely:

** Repackage and recycle existing savings - they lengthen the intermediation chains to generate more securities, thus being involved in large volumes of wholesale funding, without creating much new lending.*

** Shadow banks increase the elasticity of the traditional banking system by relaxing banks capital requirements through, say, selling loans externally to GSEs or internally to off-balance sheet vehicles, thus boosting the credit multiplier.*

Speculative appetite to borrow likely exists most of the time within the economy and seemingly this is **independent of interest rates**. Yet, shadow banks could not have single handedly started the credit boom that led up to the GFC, since they themselves ultimately **depend on bank credit**.

Nonetheless, the fragility of this wholesale funding model based on short-term repos, which themselves are subject to market pricing and are highly procyclical, heightens systemic risks. It also feeds back negatively onto the funding, as well as the lending books of high street retail banks.

26.1 Their growth (of shadow banks) is not a new economic feature, far from it, Gurley and Shaw (1960) wrote about them and foresaw many of these opportunities and their associated risks.

They made a key observation that in a growing economy, non-bank financial institutions grow/multiply in number, which undermines the effectiveness of conventional monetary policies and threatens financial instability due to their nature. According to them, the entire financial structure matters for growth and stability, and not just banks.

In fact, under certain circumstances, most commodities, financial claims and accounts receivables can be mobilized to create liquidity, which makes maintaining financial stability hard, because many of these financial intermediaries (shadow banks) will try to manufacture liquidity by creating liquid claims from less liquid securities they own.

- This is a direct hit to the important role played by the quality of liquidity

Hence why, liquidity is a vital barometer of financial stability rather more than acting as a predictor of future high street inflation, because it reflects the gross balance sheet capacity vital for refinancing debts. (Although monetary inflation is a component in high street inflation, it's not the sole driver of it)

This elasticity, coupled with sometimes unconstrained financial innovation, explains why payment systems often require a level of liquidity backstopping that only large States can provide (central banks).

Frederick Hayek, observed: *“...there exist still other forms of media of exchange which occasionally or permanently do the service of money ... [A]ny increase or decrease of the quantity of these money substitutes will have exactly the same effects as an increase or decrease of the quantity of money proper...[W]e may distinguish these circulating credits from other forms of credit which do not act as substitutes for money is that they give to somebody the means of purchasing goods without at the same time diminishing the money-spending power of somebody else... The characteristic peculiarity of these forms of credit is that they spring up without being subject to any central control, but once they have come into existence their convertibility into other forms of money must be possible if a collapse of credit is to be avoided”* (Hayek 1933, *Prices and Production*).

26.2 The drivers of this elasticity differ over time, but deregulation aside, the associated rise of shadow banking can be associated with rapid growth of wholesale money as alternative funding sources, led by CICPs (corp. and institutional cash pools). With their huge pool of funds (totalling upwards of 30\$T), they symbolize the switch in the polarity of Western financial system, where former lenders (eg. banks), became borrowers from wholesale markets, and many previous borrowers (eg. corporations), became lenders.

These CICPs are made up from:

- 1) Uninvested corporate treasury funds
- 2) Liquid asset holdings of forex reserve managers
- 3) Cash holdings of Sovereign Wealth Funds (SWFs), and institutional money managers
- 4) Cash collateral business of derivative markets

Furthermore, while traditionally high street banks were intermediating funds between Households and corporate borrowers, these flows nowadays have reversed direction. Key reason behind this, is that the heightened competition from EM producers, have progressively destroyed the marginal profitability on new capital in the west, so questioning the viability of further investment spending. In the meantime, it has hastened the drive to extract more cash flow from existing industrial operations, thus replenishing corporate treasuries. Driven further by the Asian Crisis in 1997-1998, many EM economies were encouraged to self-insure against exchange rate disruption by accumulating enormous forex reserve balances, resulting in a CICPs outgrowing the banking system.

Their typically large deposit size exceeds gov. deposit guarantees and lately banks themselves have been further constrained from taking these deposits by new capital and liquidity regulations, the so-called Liquidity coverage ratios (LCR) imposed by bank regulators. Thus, the CICPs were eager to invest their huge sum of capital which demand more alternative short-term liquid investment vehicles which made them turn instead to Treasury bills, Asset-backed commercial paper, repos and similarly collateralized instruments.

According to D'Arista (2009) writing shortly after the 2007–2008 GFC: *“...the short-term funding strategies on which the largest institutions increasingly relied also contributed to the system's vulnerability to an explosion of global liquidity as assets were monetized through their use as collateral for borrowing to buy more assets. The liquidity that resulted from rising leverage exacerbated the inherent pro-cyclicality of the system, expanding credit over the course of the boom years and leading to a rapid contraction as the downturn developed”*.

26.3 You can think of the wholesale money markets as the engine behind Global Liquidity. Their expansion, although gentle since the GFC, is still great, nearing upwards of 10\$T and the imposing role

played within these markets by the US Fed. These markets increasingly supplement retail bank deposits and now fund a rising proportion of US/International credit and liquidity.

According to the New York Federal Reserve: “.... we saw during the recent financial crisis [that] the tri party repo market was overly reliant on massive extensions of intraday credit, driven by the timing between the daily unwind and renewal of repo transactions. Estimates suggest that by 2007, the repo market had grown to \$10 trillion—the same order of magnitude as the total assets in the U.S. commercial banking sector—and intraday credit to any particular broker/dealer might approach \$100 billion. And ... risk was under-priced with low repo ‘haircuts’— a haircut being a demand by a depositor for collateral valued higher than the value of the deposit”.

27. Linkages between the wholesale money markets, the shadow banks and the traditional high street banks have become more complex over the past decades. In many cases, shadow banks are subsidiaries and sometimes off-balance sheet vehicles owned by the traditional banks themselves. Partly caused by financial innovation and deregulation has blurred the distinction between banks/insurance companies/hedge funds, and partly because of structural changes in capital flows which have encouraged the rise of CICPs.

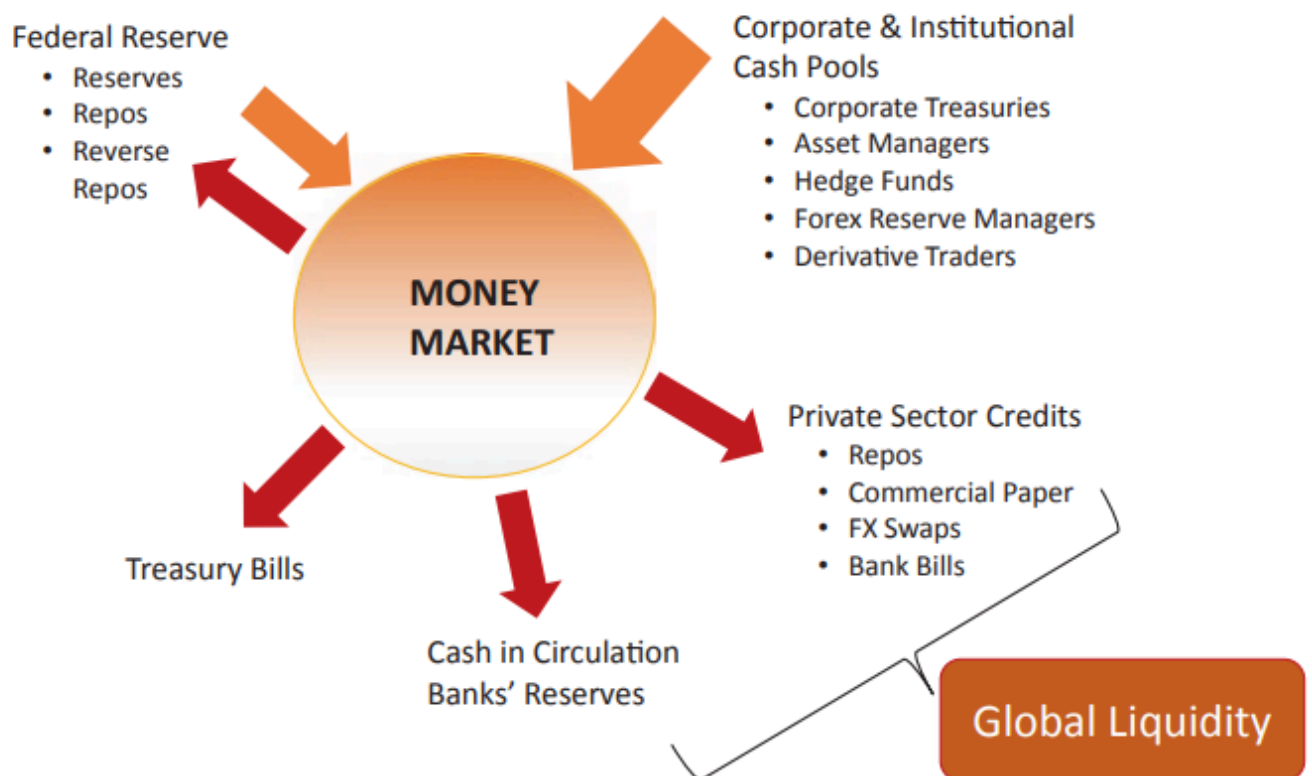


Fig. 6.7 Wholesale money markets (schematic)

The diagram above identifies the notional inflows/outflows from the US money markets. The CICPs need secure short-term liquid assets (Bills, wink-wink), which in the absence of the high street banks and the State (Central Bank reserve repos and Treasury bills) are now provided by the non-bank private sector in the form of repos and asset-backed commercial paper. The CICPs frequently engage with shadow banks in sale and repurchase agreements (repos). The whole credit system increasingly operates through these repo markets, and often with active CB participation.

A Repo or a Repurchase Agreement is a financial transaction where one party sells an asset to another party with the agreement to buy it back later at a slightly higher price(i.e. Interest for the lender). Its like a short-term loan where the asset being sold acts as collateral. A reverse repo is the opposite. Here, the buyer in the Repo transaction sells the asset back to the original seller.

A)Repo:

Seller/Lender: The party selling the asset (and promising to repurchase it later) is essentially borrowing money.

Buyer/Investor: The party buying the asset (and agreeing to sell it back later) is essentially lending money.

B)Reverse Repo:

Buyer/Lender: The party buying the asset with the promise to sell it back later.

Seller/Borrower: The party selling the asset with the promise to repurchase it later.

27.1 These Repurchase Agreements are means of short-term borrowing, and they are essentially a form of collateralized interbank borrowing that has grown to eclipse in size the Pre-2008(GFC) uncollateralized interbank loan market, because it's much more safer and doesn't require trust among the parties. And because it's not restricted to traditional banks, the repo market has become the primary monetary policy conduit for CBs. However, unlike the Fed Fund markets(uncollateralized overnight market for banks), repos are highly leveraged, often needing "big" liquidity injections to be backstopped.

= Why are Repos can be (and are) highly leveraged, unlike the Fed Funds Market?

1) Risk and Security -

> Fed funds market is unsecured, higher credit risk and limited to interbank lending(Only depository institutions with accounts at the Fed are eligible to interact with)

> Repo market is secured, lower credit risk due to the collateral and open to wider range of financial institutions(Banks, hedge funds, insurance companies, mutual funds, and more)

2) Leverage Capability -

> Fed funds market cannot be leveraged, because the loans are based on excess reserves and do not use collateral to create additional borrowing capacity

> Repo market can be highly leveraged, due to the use of collateral, which allows financial institutions to borrow against securities(Gov. bonds) increasing their ability to take on more debt and invest in more assets

3) Monetary policy influence -

> Fed funds market is directly influenced by the Fed Reserve monetary policy, with the fed funds rate being a key target

> Repo market is influenced more by market conditions, such as the supply and demand for collateral and cash, though central banks can influence this market indirectly through open market operations and other monetary tools

4) Purpose and use -

> Fed funds market is primarily for banks to meet reserve requirements and manage short-term liquidity

> Repo market is used for short-term funding, liquidity management, and leveraging investment strategies

27.2 Traditional banks are no longer the biggest source of lending, but they still intermediate the bulk of these flows. The increasing use of repos, carry trades and currency swaps underscores the importance of the balance sheet capacity of the financial sector.

^ Carry trade = financial strategy where an investor borrows money in a currency with a low interest rate and invests in a currency with a higher interest rate. The goal is profit from the spread between the two.

^ Currency swap = financial agreement between two parties to exchange cash flows in different currencies. The swaps are typically used to hedge against currency risk or to obtain cheaper financing.

The repo mechanism bundles together “safe” assets as collateral (gov. bonds), foreign exchange and high-grade corporate debt, and uses these as security against which to borrow. In practice, US Treasuries and German bunds dominate the market in top-quality or pristine collateral. The borrowing party in the repo puts up collateral, such as the two mentioned, and they are paid for the value of that asset on the promise to buy it back later (repurchase) at a higher price (interest). These periods can be overnight, 7 days, 14 days, 90 days or sometimes longer. Often this collateral is lent out again (hence, highly leverage-able, or re-hypothecated) so generating a supply of credit outside of traditional fractional-reserve high street banking.

This international repo market is huge, representing around 8-10\$T of collateral (2019 numbers, more probably atm), with non-bank lenders often holding more assets than traditional banks.

27.3 Using collateralized loans protects the lender against the borrower's default. The dominance of the CICPs has resulted in an ever-increasing use of collateralized borrowing and the associating rehypothecation agreements or leveraging up, which allow it to be reused in other transactions. Reusing pledged collateral allows credit to be created in a way that is similar to textbook money-creation process involving the deposit-loan multiplier and governed by Central Bank reserves.

^ Deposit-loan multiplier = When you deposit 1000\$ in a bank, the reserve requirements imposed by the Central Bank allows the bank to hold for example 10% of the original deposit as reserves. Thus allowing the bank to lend out the rest. Thus if you deposit, the bank gives a loan to another entity, the entity deposits again somewhere, and the other bank lends out again, this is literally generating additional money from thin air. This is Fractional Reserve banking and the subsequent money/credit creation that allows banks to create money from thin air.

The collateral represents the high-powered money component; the collateral haircut corresponds to the banks' reserve ratio and the length of the collateral chain, i.e. the number of times the collateral is re-pledged, is equivalent to the traditional money multiplier ($\text{Money multiplier} = \$ / \text{Reserve Requirement}$). Yet, trust (counterparty risk) and the risk appetite of lenders clearly play bigger roles in the modern credit system compared to previous times, where gov. regulation (statutory reserve requirements), lender of the last resort and insured deposits are key factors. The collateral multiplier (in this case the “haircut”) is market determined and sensitive to investors' risk appetite, as captured by fluctuations in the Bond Vol. Index or MOVE index.

27.4 Basically the same bonds can be repo-ed several times. According to IMF estimates, this so-called Collateral Multiplier stood as high as 3 times in 2007. The rehypothecation of collateral stretches it out, making funding liquidity more elastic. Yet, the continual re-pledging of collateral has limits, because haircut progressively reduces the credit-raising potential of the underlying asset. These haircuts inversely determine the maximum leverage, with a 2% haircut allowing you to leverage up to 50 times. *These haircuts fluctuate wildly, affected by volatility and rate hikes.*

The problem with this dynamic (if not obvious till now) is that several agents are counting on this same

collateral as backup in case things go wrong, rehypothecation also risks excessive leverage, and given the interlocking nature of intermediaries' balance sheets, this heightens system risks.

At critical times, this risk may encourage hoarding of collateral as well as of cash, leading to a potentially greater collapse in liquidity when fungibility disappears, which inevitably happens when rough times come.

For example, haircuts on US treasuries jumped from 0.25% to 3% in the lead-up to the GFC, while haircuts on ABS(asset-backed securities) soared from 4% to 60%. This means that leverage potential collapsed from 25:1(Lehman Brothers were leveraged at about 16:1) to barely 1.7:1. In addition, it should be remembered that while holding collateral will help to some extent in mitigating credit risk, maturity transformation remains(gap between asset duration to liability duration), and it is highly dependent on being able to rollover or refinance positions.

27.5 The greater the size of the wholesale money markets, the greater the demand for collateral. The resulting hunt for profits, and subsequently hunt for collateral, encouraged the issuance of high-grade bonds, which in turn, created more space in the capital stack, allowing greater lower-grade bond issuance. CB QE policies which focus on the money markets likely explain some of this ballooning in size of the US corporate credit markets.

28. The Liquidity multiplier

The expansion of private sector liquidity can be thought of in terms of a multiple of certain key assets, or safe assets and sometimes high-powered money(Or Central Bank money).

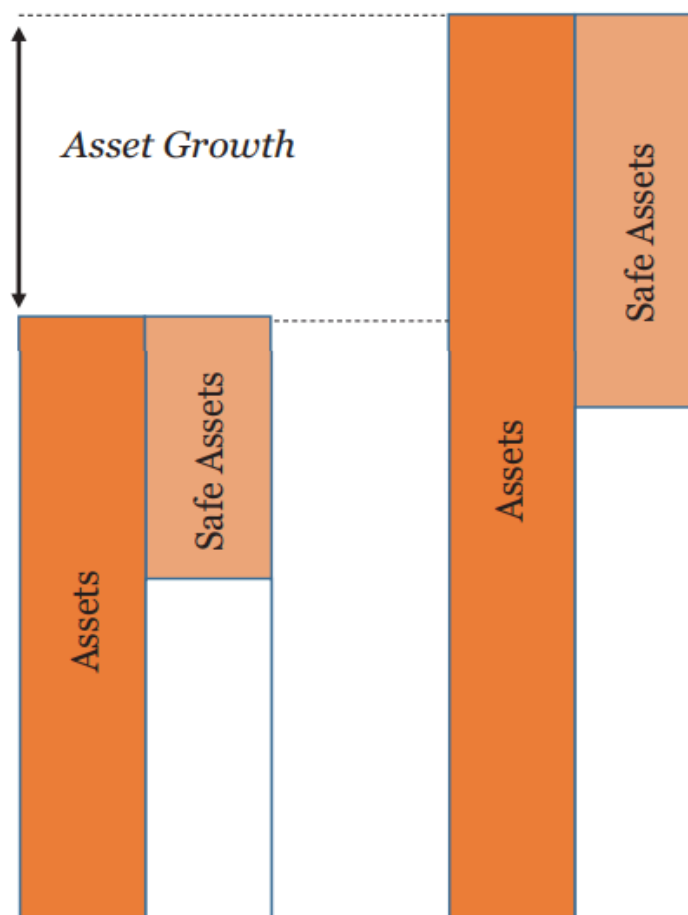


Fig. 6.9 Safe assets and balance sheet expansion (schematic)

The schematic above shows that a balance sheet expansion requires a proportional increase in holdings of safe assets. In practice, there are probably twin, overlapping multiplier relationships between the traditional monetary base and the available pool of collateral, which together impose both regulatory/prudent risk limits on balance sheet expansion.

The traditional money multiplier model(as we explained towards the end of last point) is no longer a valid description of liquidity creation.

1) it only covers the traditional high street banks, which have been eclipsed by other credit providers(shadow banks)

2) It ignores the role of collateral, which has become more important as credit providers increasingly fund themselves thru wholesale money markets.

3) bank lending is neither constrained by the lack of deposits nor the Central Bank's supply of reserves. This is because alternative funding is often readily available from domestic/off-shore wholesale money markets, but banks typically lend first and then search for the necessary funding. This sets traditional banks apart from all other financial institutions because they can issue their own liabilities(demand deposits), that serve the non-bank sector as means of payment.

^Lend now, get funded later - A customer approaches Bank A for a loan to buy a house. Bank A approves the loan and credits the customer's account with the loan amount, creating a new deposit. Now bank A's assets increase by the loan amount(this is the loan that the customer needs to return) but also their liabilities increase by the loan amount(this is the deposit or the money that the customer got in the Bank). Now bank A needs an additional X amount of funds to satisfy the reserve requirement. Bank A can now borrow the X amount for the reserve requirement from another bank(wholesale money markets) in order to satisfy the reserve requirement. This is effectively minting money.

Therefore, traditional banks, at least in theory, should face fewer funding constraints than other financial intermediaries, making their funding more elastic. As long as requirements are satisfied or indirectly circumvented via shadow banks, the traditional banking system should be able to accommodate additional credit demands by simply creating new means of payment in the process of making new loans. These banks are usually backstopped by the Central bank(lenders of last resort), and by the organized State deposit insurance. But these are not always so straightforward. This "backstopping" provided by the State/Central bank create room for moral hazards, such as when banks over leveraged themselves in the wake of the GFC, because they wrongly assumed that the interbank markets could provide even greater liquidity backstopping, with extra insurance coming from CDS(credit default swaps).

28.1 The monetary base consists of the so-called high-powered money that Central Banks notionally create and control. Yet, financial innovation, deregulation and fast moving cross-border capital flows have lately compromised official influence. New forms of high powered money have been created that have appeared to boost the effective size of the monetary base, and thus allowing credit providers to expand liquidity independent of Central Bank actions.

=> Put another way, *the size of the Federal Reserve balance sheet is no longer the monetary base of the US dollar credit system. The system itself has outgrown and surpassed the Fed's control over it.*

Today, this high-powered money also includes offshore pools of US dollar deposits, such as the Eurodollar Market, that can be borrowed by any commercial bank short of reserves. On top of this, these shadow banks can create credit, formally outside of Fed control. These assets can be further repo-ed to

attract funds from large CICPs, which in turn, can be on-lent to traditional banks for extra funding. US authorities have been trying to take control over by embracing non-bank credit providers, and by altering US tax code to try to reduce the pool of cash available to offshore Eurodollar markets.

28.2 “Hierarchy of Global Liquidity”

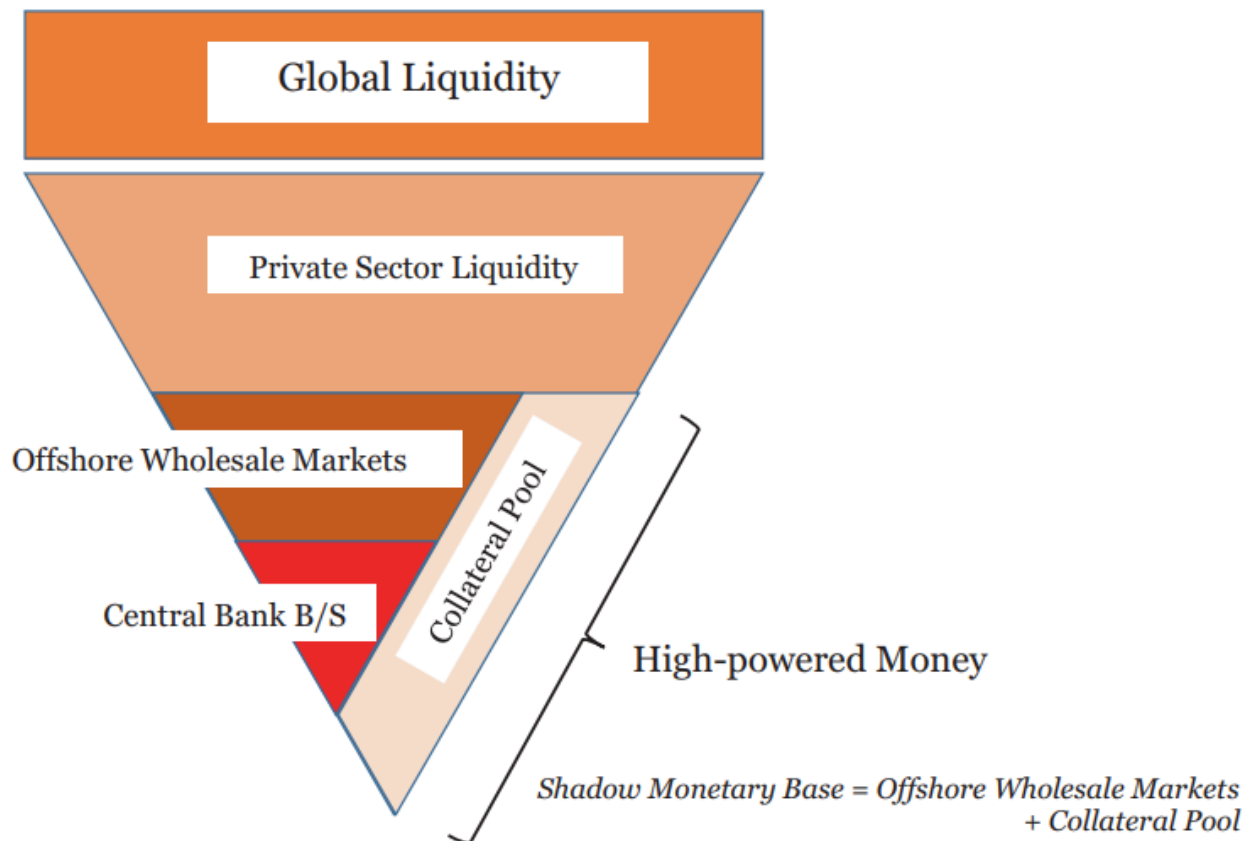


Fig. 6.10 The hierarchy of Global Liquidity (schematic)

The wider expansion of private sector liquidity at the top of the inverted pyramid rests on a narrower base of high-powered money that includes balance sheets of the Central Banks(monetary base) as well as:

- 1) Offshore WholeSale money markets
- 2) Available pool of private sector collateral

These two additional sources of high-powered money, that lie beyond the traditional definition of the monetary base, can be thought of as the shadow monetary base.

In the traditional finance model, high street banks use a leveraged balance sheet to recycle savings. An increase in the monetary base is subsequently associated with a greater stock of bank loans. Extra reserves allow banks to proportionally expand their deposit bases, i.e. make more loans.

28.3 As noted before, the traditional Reserve/Deposit multiplier, has been replaced by Collateral/Loan multiplier, led by wholesale money markets. Yet this transmission channel may still require a larger Central bank balance sheet(traditional monetary base), when it involves increased repo activity(Purchase and sale of Treasury notes) between the Central Bank and the dealer banks in the money markets, which allows them to increase their leverage.

=>1) Assuming that the Central bank injects funds thru repos.

2) This increases the cash resources of a money market dealer, who will pay away the short-term financing but will keep the coupon payment on the bond, less some margin.

3) This enables the dealer to purchase more bonds in the open market, and potentially repo them again(rehypothebate).

4) This should encourage more risk-taking elsewhere in financial markets including greater demand for loans.

5) On the other hand, the supply of these Loans are further stimulated, when the value of collateral itself climbs higher.

Although, some experts believe that this transmission mechanism may be compromised because Central bank repo activity, by definition, removes precious collateral from the private sector. However, this is often offset by the subsequent increases in collateral values.

28.4 Expanding on the Money multiplier and collateral multipliers:

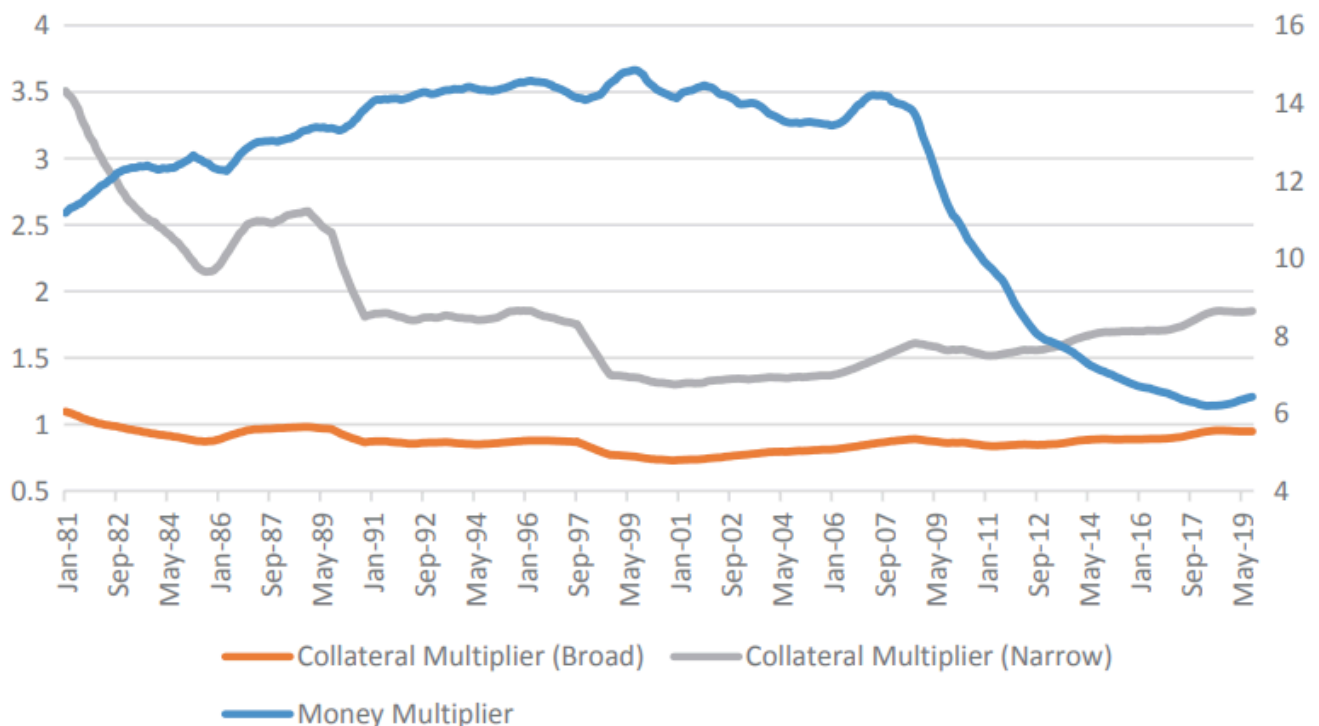


Fig. 6.11 World money multiplier and collateral multipliers, 1981–2019 (times)
(Source *CrossBorder Capital*)

= World Money multiplier = ratio of total liquidity to base money

= Narrow collateral multiplier = stock of government bonds issued by developed economies

= Broad collateral multiplier = narrow + the addition of all liquid assets(bank deposits + money market funds), in both developed/Emerging economies.

Data above shows that the money multiplier(right axis) peaked at 15x in the late 1990s, before peaking(below the other peak) just before the GFC, followed by a collapse when Central Banks plowed

in cash support. The broad/narrow collateral multipliers both show far greater recent stability(as of 2019) and highlight generally smoother increases towards one or two times, since 2000. *Additionally, private sector liquidity rises together with increases in collateral values.* Fiscal policies engaged by the majority of governments around the world(easing/tightening) may be indirectly depleting/replenishing financial markets of a precious source of safe asset collateral.

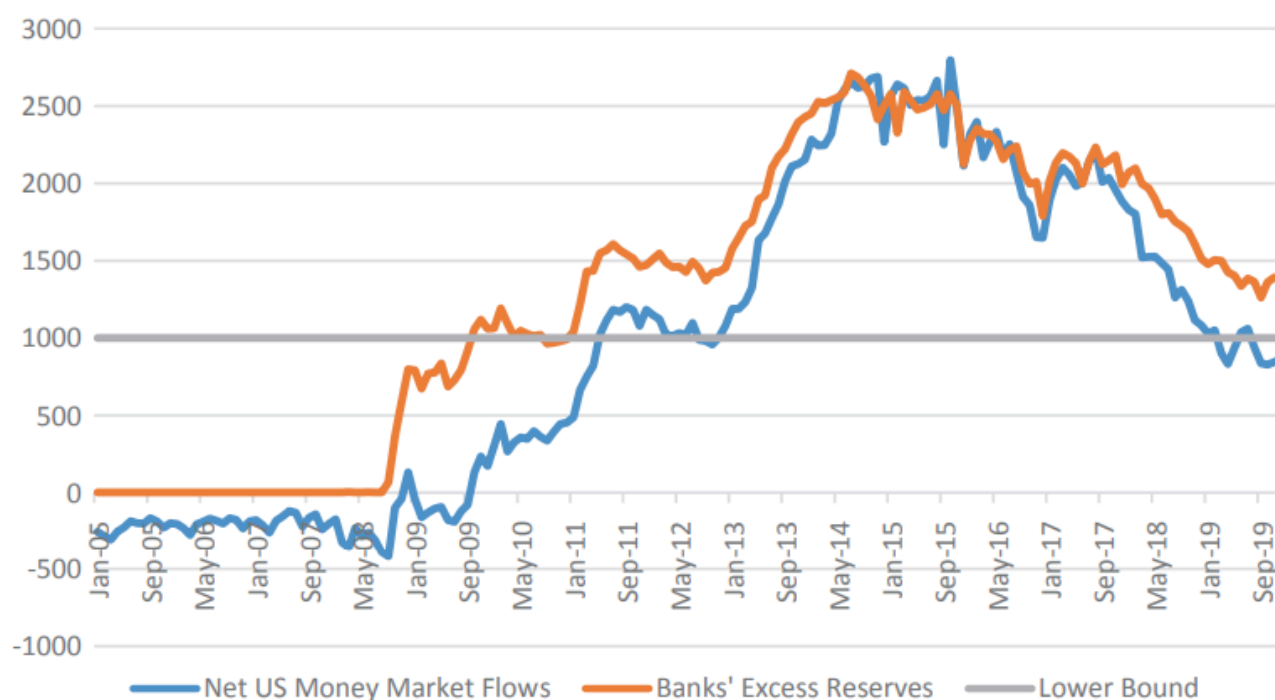
29. In summary,(1) *liquidity should be seen as a gross funding concept that represents the size of financial balance sheets.* Liquidity is broadly defined as to include global or cross-border effects, that expands beyond the traditional retail banking sector, such as corporate cash flows, repo and wholesale money markets.

Today, (2) *most credits take the form of collateralized loans that derive from wholesale money markets, not banks.* Ultimately, sourced from CICPs, and which are mainly used for funding(refinancing existing positions), rather than borrowing for new capital projects/investments.

In a world dominated by funding rollover of huge outstanding debts, rather than new capital projects, (3) *balance sheet capacity(liquidity) is more important than the level of interest rates(cost of capital).*

(4) *Liquidity has both private sector and Central Bank dimensions, with the private sector dependent on being able to bundle up good quality, longer horizon securities as collateral and the Central bank acting as a liquidity backstop in case of emergency.* (5) *Meaning that if the funding stops/slows, which in turn, may arise because of lack of sufficient good-quality collateral and/or the withdrawal of Central Bank liquidity support, might mean that we will have a crisis because of the need of refinancing the towering debts on top of debts.*

The conclusion is that QT and public sector austerity policies that diminish the supply of government bonds create a dangerous mix that threatens severe and persistent financial market volatility. Evident in the close co-movement between US banks' excess reserve holdings(surplus to statutory requirements) and US money market flows.



Looking at the chart above, it highlights the 2013 so-called “taper tantrum”, when hints of policy tightening by the Fed triggered a market sell-off, and the September 2019 surge in repo rates to 10%, or well above the then prevailing Fed Funds rate of 2.14%. Both events coincided with brief dips in money market flows below the critical threshold of 1\$T and banks excess reserves falling below 1.5\$T, a “line” raising significantly since the GFC by Basel III regulations. These thresholds may prove the liquidity danger lines that the US monetary authorities dare not to cross in the future. Yet we have them crossed currently(24/05/24). Liquidity injections imminent?

30. Central Banks - Although important in past times, the financial innovation, the freeing up of international capital flows and the dynamic rise of new economies have progressively diluted the traditional powers of Central banks around the world. They still play a crucial, yet controversial role.

They can supply as much liquidity, at a fixed policy rate, as they deem necessary for the efficient functioning of the financial system through their monetary operations:

- (1) Interest rate and “forward guidance” policies
- (2) Changes to the size/composition of the Central Bank’s balance sheet

Lower expected interest rates are thought to lead to faster economic activity, helping to satisfy policy-makers’ mandates for price stability + high employment. However, nowadays it’s actually increasingly questioned if lowering interest rates unambiguously eases monetary conditions. This is because of the adverse supply and demand effects, such as the drag that low/negative interest rates can have on bank profitability and the functioning of the repo markets, and the second-round effects that ultra low policy rates may have on reducing inflation expectations and raising investors’ precautionary demands for safe assets.

^ “Reversal Rate” = This defines an effective lower bound on policy rates since below this threshold lower rates are contractionary. It operates through banks’ net worth and capital adequacy because they face a two-way pull on profitability from lower interest margins on new business versus larger capital gains on bond positions.

While some argue that QE could raise the medium-term level of the reversal rate by reducing the potential for capital gains, there is a more persuasive argument that could be made with regard to a threshold for financial stability rather than policy stimulus. Hence, below this threshold, systematic risks may escalate.

30.1 Despite their claims, in practice CBs exercise little effective control over the term structure of interest rates and at times they are even “powerless” to determine the volume of liquidity, most notably in the face of large and often volatile international capital flows, or when bankers refuse to lend(2019 US repo crisis) and debtors are reluctant to borrow.

Furthermore, the textbook model says that Central banks can progressively spread their influence along the yield curve, by controlling the level and expected future path of short-term interest rates. Movements in the long-term rates affect capital spending and by influencing business cycle fluctuations, so this also changes the inflation rate. There are several suspect links in this causal chain.

- 1) Short-term and long-term rates frequently diverge because of highly erratic bond term premia.
- 2) It is far from clear that long-term interest rates influence the capital spending cycle
- 3) The idea that the business cycle determines inflation is based on the increasingly discredited

Phillips Curve model.

Contrary to this, it's better to see inflation and deflation more as real economy phenomena(e.g. The result of low Chinese wage rates), rather than a monetary or financial feature, and likewise you can see real interest rates largely determined in financial markets by fluctuating bond term premia and credit risk premia, rather than driven solely by the real economy. We can draw evidence for this from the late 19th century to show the disconnect between asset prices and liquidity, on the one hand, and high street inflation, on the other.

Despite a huge jump in “global liquidity” following soaring South African gold production(you can see this as monetary inflation), technological advances and better logistics often resulted in falling high street prices and simultaneously leading to a two-and-a-half-fold leap in Wall Street stock prices between 1896-1912. Therefore, to claim that Central Banks have reached the highest degree of policy precision, where, by tinkering with short-term policy rates, they can choose a desired inflation rate is surely fanciful?

Inflation has almost certainly been strongly influenced by cheap Chinese imports over the past two decades. Central banks focus on inflation targets on the other hand, which comes at a cost of greater financial instability.

30.2 CB's QE vs Treasury debt issuance: Is there any difference between the two?

In America, for example, the Fed with its 4\$T balance sheet is far smaller than the 23\$T stock of outstanding US treasury debt, which is expanding at a 1.5\$T annual clip. Both entities are involved in monetary policy/fiscal policy, so in truth, a continuum exists between the two. Both of them supply “safe” assets, but the Fed is more focussed on the Banking and Money markets, while the Treasury is dealing with the longer-term capital markets.

The supply of safe assets serves as a critical function because they support financial sector balance sheets and allow them to expand. Big balance sheets matter far more in a Refinancing Financial World, than in the “old world”, where the need to finance new business, and subsequently, the interest rates and the cost of capital were far more important.

We can measure this efficacy of monetary transmission in terms of the multiplicative change to overall liquidity that derives from an increase in high-powered money.

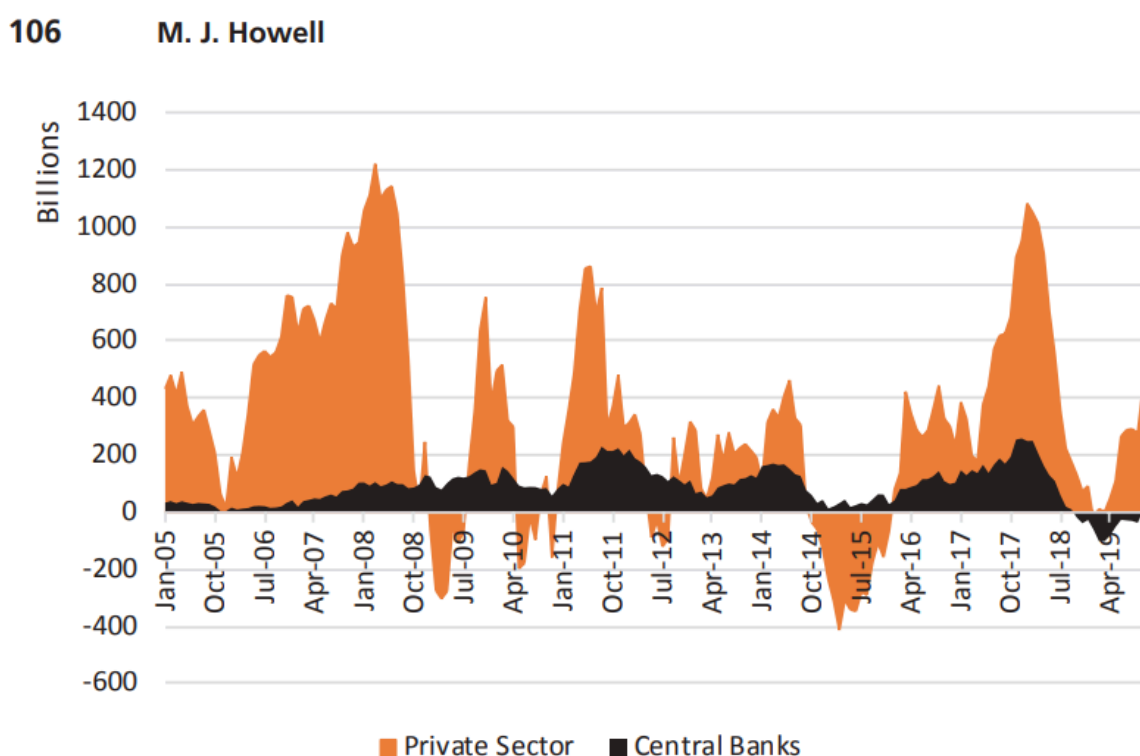


Fig. 7.1 World Central Bank liquidity provision and Global Liquidity, 2005–2019 (US dollars in billions, 12-month changes) (Source *CrossBorder Capital*)

This is the annual movements, measured in US Dollars, in GL and World Central Bank money. While the link between the two is clearly not one-to-one, the chart still reveals a close linkage. This has become more noticeable since the GFC. Swings in Central Bank money result in far bigger moves in GL, and periods of slow Central Bank money growth seemingly precede collapses and often absolute contractions in GL.

30.3 Funding/Availability of collateral(i.e. Taking into account the variable haircuts applied by lenders) and the ability to source funds internationally through the EuroDollar and swap markets all need to be included. This broadens the monetary base beyond the size of the Central Bank balance sheet by introducing new sources of high-powered money.

These new sources are called shadow monetary base, typically display a different character. Market-based wholesale funding(i.e. Shadow monetary base) tends to be both more pro-cyclical and often short-term, or much different than the earlier model of dependable retail deposit funding. On top of this, these entities are less disciplined by Central Banks, due to their comparatively small size. The focus is usually on the High Street banks.

These balance sheet policies were traditionally described as Open Market Operations, but they are now dubbed QE/LSAP and the counterpart, QT. The Standard model assumes that banks are entirely funded by retail deposits, and assumes that credit is created from these deposits, subject to reserve-backing, and shortages are priced at the policy interest rate by the Central Bank. Yet, in practice, liquidity is not fungible and, especially during crises, banks are more frequently funding constrained than reserve constrained. Funding might be available from many sources, but is far less reliable and more capricious(unpredictable) wholesale sources rather than retail sources are becoming increasingly important. This has resulted in a structural change in financial markets, which is that many industrial corporations have become providers of wholesale funds to banks rather than net borrowers. As a result of this change, although the **Central Banks set policy rates, market rates will differ because of potentially large fluctuations in risk premia.**

30.4 Thus, Central Banks around the world adopted “Unconventional” monetary policies during the GFC. These policies can be thought of more broadly as Quantitative policies, where Central Banks use their balance sheets to affect asset prices and financial conditions, beyond simply moving short-term interest rates. LSAP/QE is one example of these policies.

They differ from the conventional interest rates policies, both conceptually and practically, especially when considering that the level of the short-term policy interest rates can be set independently of the volume of bank reserves in the system. **Key distinction between Balance sheet policies/Interest rates.**

=> The main transmission channel operates by altering the composition of private sector balance sheets. Assuming that the targeted assets are not perfect substitutes, then by altering the mix and risk profile of private portfolios, say, through the purchase of risky assets, the Central Bank can reduce yields and ease funding conditions. This suggests that **High street banks’ statutory reserves are less Significant than widely perceived, rather the types of assets that the Central Bank buys/sells, and the credit it directs are much more important.**

30.5 Central Bank is not necessarily the Monetary Authority for each economy, therefore high-powered money is not always synonymous with “reserve money” or “Central Bank money”. Reserve money itself is made up of currency + regulated banks’ reserves held at the Central Bank. This money largely covers

the size of the national Central Bank balance sheet, but it should also include the balance sheets of all institutions that are part of the Monetary Authority. The difference between the overall balance sheet and reserve money is mainly accounted for by of:

- Non-financial assets, such as Real Estate;
- Non-private sector liabilities, such as holdings of public sector deposits:

Monetary Authority is a broader concept than Central Banks, covering the entire “control” of the State over its monetary system and it can include institutions beyond the Central Bank. Therefore, policy decisions likely involve a number of official bodies and operate across both the interest rate setting and volumes/types of financial assets bought/sold in the markets. Frequently, the Finance Ministry exercises control over the exchange rate, even though its policies may be implemented by the national Central Bank.

Consequently, every government’s funding policy will also affect its national monetary conditions, whether this involves the decisions about how much debt to sell/specific maturities offered, its use as collateral and whether Treasury balances should be deliberately built-up/run-off.

30.6 Today, the Money and Capital markets have become the crucial conduits for funds and the key determinants of the cycle of liquidity flows and the frequency of crises. On top of this, large parts of these markets lie beyond regulators’ grasp.

Money and Capital markets are linked through the wholesale funding system. While the supply of high-quality collateral is important for wholesale funding, evidence suggests that modern financial systems struggle to operate without large Central Bank balance sheets.

Central banks have outsized-effects in deregulated financial systems, where retail deposits are no longer the sole funding source, because what matters is the ability to refinance positions and in the end, Central Banks are the marginal suppliers of this liquidity.

=> The modern financial system is essentially “capital refinancing” and “distribution mechanism” that are used extensively to roll-over existing positions, rather than simply “capital-raising” mechanisms used to obtain new finance(like it used to be)

30.7 The large volume of Global Debt that currently needs to be refinanced and the prevailing huge overhang of derivative instruments, together require large balance sheet capacity from robust and dependable institutions. This means that the Capacity of Capital(Quantity of liquidity) matters more than the Cost of Capital(Interest rates). Thus, the relationship between interest rates and the supply of liquidity is rarely one-to-one. At rough times, liquidity must be injected into the system(and nowadays more often just to sustain the system at a stable level) even if the officials are tightening on paper. This has come to fruition after the GFC.

This also means that funding(gross claims) is distinct from and far larger than the new credit provision(net claims). Assuming a high and steady level of refinancing needs, then:

- 1) The inherent cyclicity of private sector money market flows
- 2) The uneven distribution of liquidity
- 3) the fact that liquidity is never fungible in crises, the very times that it matters the most, that's when Central Banks are forced to step in.

These interventions by the Central Bank into money markets significantly affect the elasticity of the financial system thru the volume of funding liquidity and, sometimes directly, the depth of market

liquidity. This link between, say, the Federal Reserve's QE operations and the US money markets might be thought of as paralleling the historical link between the Central Bank and the high street banks, at times when statutory reserve requirements mattered.

30.8 Central Banks conduct monetary policy through two instruments(mainly).

- 1) Short-term Policy rates
- 2) Forward-Guidance(more important for tech stocks/crypto)

Main problem with these policy rates(both guidance and current rates) is that when they approach zero, they become significantly less able to provide stimulus and arguably even becomes counter-productive, because it can actually hamper credit supply(if you are a lender and know that we are at the lower-bound(rates in reality cant go lower and only higher) you will be less likely to lend). Example of this is the GFC. Once Fed Rates approached zero lower-bound in December 2008, in the immediate wake of the GFC, US Policy-makers conducted 3 rounds of LSAPs, the eponymous QE1/2/3, over the following 5 years. This was the only way of stimulating the economy when the rates were already at zero.

1) First round of LSAP or QE1 consisted of buying Fannie Mac/Freddie Mac debt(up to 100\$B), and an additional 500\$B of agency MBS. The program was extended and expanded in March 2009, so by the end of QE1(March 2010), the fed had bought 1.25\$T in MBS, 175\$B in federal agency debt, and 300\$B in US Treasury Securities

2) QE2 started in August 2010, which was implemented from November 2010. It consisted of purchasing 600\$B of long-term US Treasury securities.

3) QE3 was announced in September 2012, consisting of monthly purchases of 40\$B agency MBS and, from January 2013, a further 45\$B of US Treasury Securities.

Some argue that QEs actually create new risks, rather than stabilizing the financial system. According to academic literature, QE policies can affect the real economy thru numerous transmission channels, such as:

1) Yields: QE directly impacts the yields of Treasury and MBS, although the effect varies across the different rounds of QE. Researchers found that QE1/QE3(Post-GFC) decreased MBS and Treasury yields. They show that MBS yields were more strongly affected (across both rounds) and that QE3 effect on MBS yields was much smaller than that of QE1. Moreover, QE2, which consisted only of Treasury Purchases, had a limited effect on yields.

2) Mortgage refinancing: Study shows that when the Fed bought MBS during QE1, it led to a boom in the refinancing of existing mortgages, in particular the ones that were eligible for purchase by the Fed. Refinancing at a lower interest rate means that there will be an increase in each household's net worth as its debt burden is decreased, which in turn, allows them to increase consumption. QE can thus stimulate aggregate demand by making mortgage refinancing more attractive, assuming that households maintain positive house equity.

3) Bank Lending: The study found that banks that owned more MBS prior to QE enjoyed faster loan growth than banks that had little to no MBS holdings. Thus, by purchasing MBS, the Fed was able to generate additional bank lending. Acting like a conventional interest rate cut, QE can encourage additional bank lending, which in turn generates more economic activity.

Instead, we can categorize these as two broader transmission channels:

- 1) Credit channel, and
- 2) Risk-taking channel;

First, the Credit Channel(1), refers to all actions that alter the volume of system-wide liquidity, such as deliberate policy easings, but not restricted only to QE policies:

- a) Cross-border inflows
- b) exchange rate changes
- c) collateral effects

Earlier in the book, we focused on the importance of the Exchange Rate and Cross-border flow dimensions.

Second, the Risk-taking Channel(2), includes portfolio effects, and describes actions that alter the ratio between holdings of risk assets/holdings of safe assets. It might indirectly result from:

- a) more Central Bank QE;
- b) from perceptions about the changing business
- c) geopolitical shocks and they also include the effect of lower volatility and the 'feel good' impact from rising collateral values.

The studies done on these events(QEs), underplays the effect of QE both in pushing asset duration below target(going from long-duration bonds > short(er)-duration bonds) and on risk appetite because it focuses on its impact on asset prices during very short duration time windows. Thus, studies done on these events are focusing primarily on the instantaneous effects of QE, rather than the long-term changes in risk taking. In every case of QE(1,2,3), persistent QE policies ultimately pushed term premia higher(demanding higher yields) and tightened credit spreads(credit spread is the difference between corporate and government bonds)

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M. J. Howell

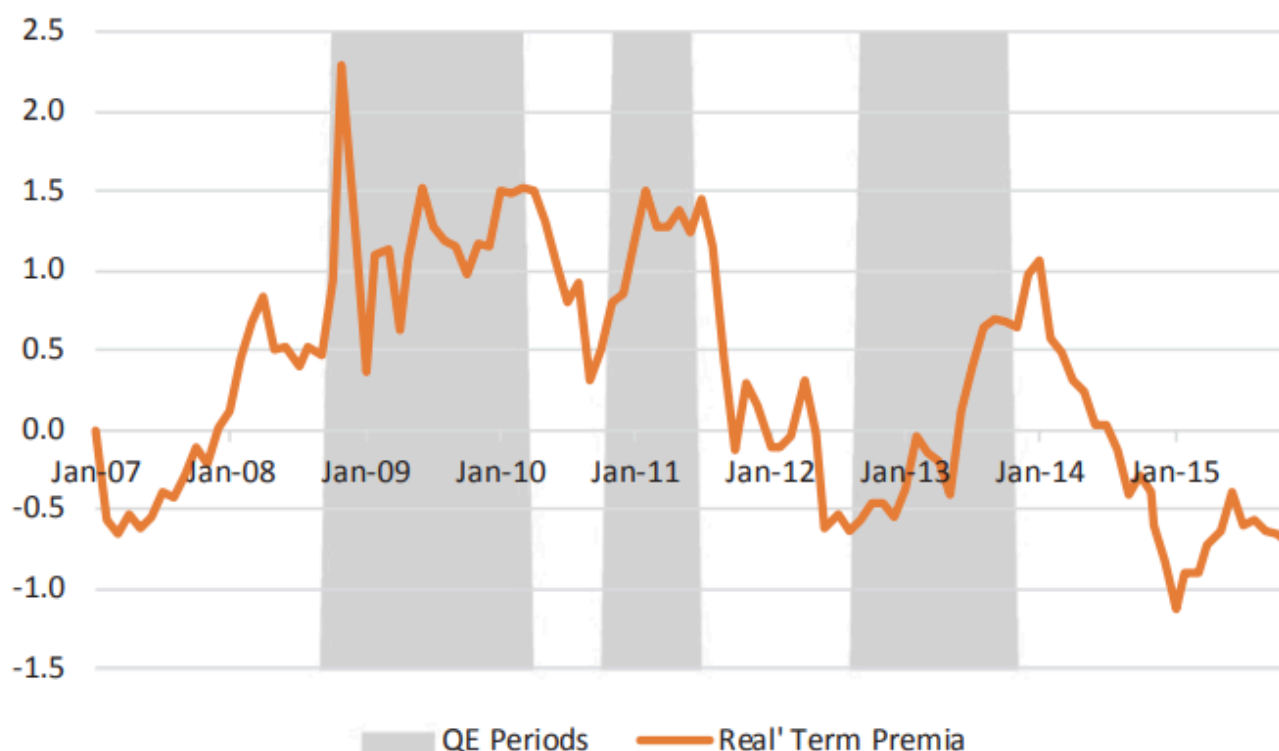


Fig. 7.2 US 10-year Treasury term premia (adjusted for inflation and volatility), 2007–2015 (percent, QE periods shaded) (Source Federal Reserve Bank of New York, *CrossBorder Capital*)

The image above shows that when Liquidity is abundant(shaded areas), the odds of default reduce and systemic risks fall, so investors are “encouraged” to move out the risk curve by switching from “safe” to “risk” assets.(Gov bonds => equities/corporate credits/new capital projects) This also encourages credit providers to move out of Treasuries, pushing up their yields, and into loans, attracted by higher margins.

The rise in Treasury yields is largely down to fatter term premia. Similarly, as levels of liquidity sink, so the process reverses as investors and credit providers scramble for safety, thus ending up with slimmer/even negative term premia and lower gov. Yields. Therefore, rather than reducing bond yields, QE policies tend to increase them, both in absolute terms and also relative to short-term policy rates.(by average of 134 bp across three us QE phases)

Contrary to many beliefs, QE policies increase term premia, and QT policies decrease them. Risk appetite plays a huge role!

30.9 A US monetary expansion that boosts the foreign exchange reserves(selling dollars and buying another currency + this also increase dollar liquidity) and given that most of the foreign currencies closely shadow the US unit, the implied increase in foreign exchange reserves will not only be monetized domestically, but may also show up as increase in US dollar held in official custody at the Federal Reserve. Adding the US monetary base to this pool of official US dollar assets held in custody give the US dollar monetary base.

The US dollar monetary base(Ticker: WRBWFRBL+FDHBFIN)

=> Although its double counting, it actually allows us to incorporate more information when one of the components its updated weekly, rather than monthly.

=> The ticker above(better done in Google sheets) can be used as a proxy for GL.

31. Global Liquidity is dominated by private credit money, but because its denominated (largely) in US dollars, the Fed is playing the role of lender of last resort(LoLR), even tho its legal authority is national. The Fed is essentially a hybrid between a national bank and international bankers' bank.

They provide liquidity internationally mainly thru Liquidity swaps and foreign exchange swaps. The latter has grown ever since the GFC, largely USD denominated. However, several experts remain worried that this system of cross-currency basis swaps not only disobeys the theoretical covered interest parity(CIP), but deviations away from CIP appear to be positively correlated with strength in the US dollar exchange rate.

=> CIP = the difference in interest rates between two countries is equal to the difference between the forward and spot exchange rates. Essentially ensuring that there is no arbitrage to be exploited by investors when exchanging currencies with hedging through forward contracts.

= When 'disobeyed', it indicates the presence of an arbitrage opportunity. It basically means that there is a discrepancy between forward/spot exchange rate relative to interest rate differentials, potentially leading to significant currency flows and market instability.

The premium can be explained by frictions, but its systemic movements suggests that it reflects a US dollar scarcity created either by a lack of balance sheet capacity and/or by the greater demand for hedging strategies.

31.1 As a result, these foreign exchange reserve movements have a impact on both the monetary base and the growth of total liquidity. The US dollar denomination and dominance means that any shift in foreign exchange markets, whether through a change in reserves/in parities, will affect GL.

32. World Central Bank money

While central bank money has been growing exponentially across different countries, the US stands as “modest” in comparison to SNB, BoE and the PBoC.

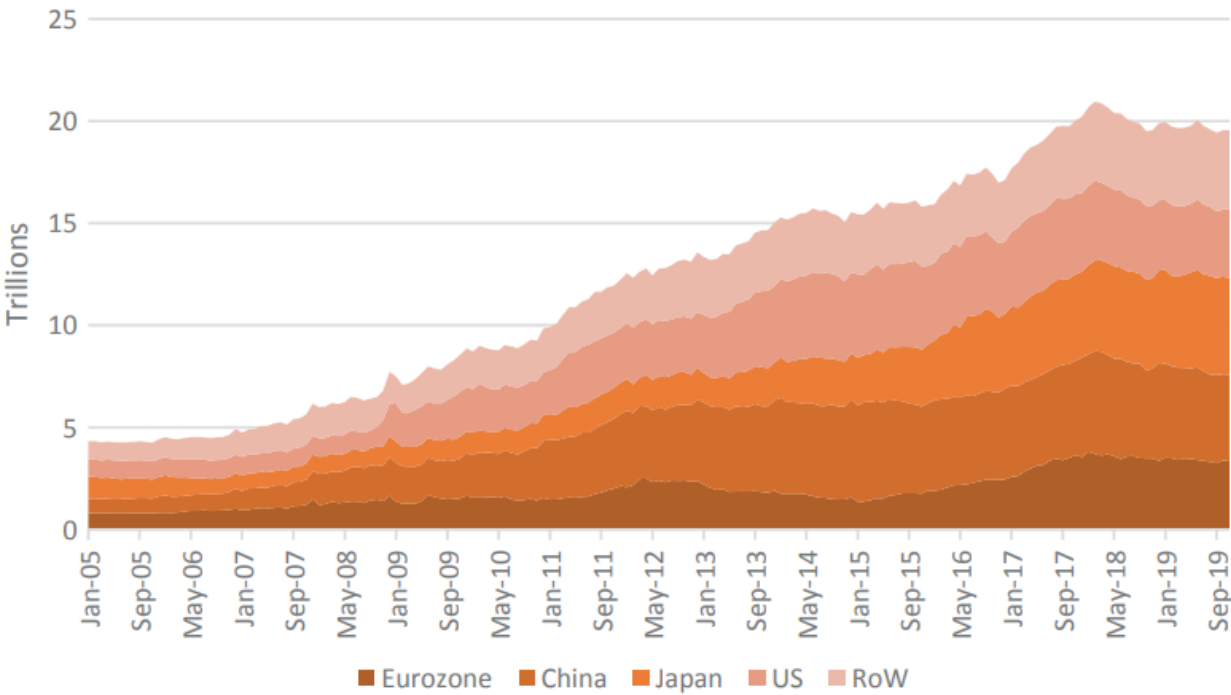


Fig. 7.3 World Central Bank money—by region and major Central Banks, 2005–2019 (US\$ in trillions) (Source CrossBorder Capital)

Next chart show the power across Central Banks in terms of Balance Sheet size.

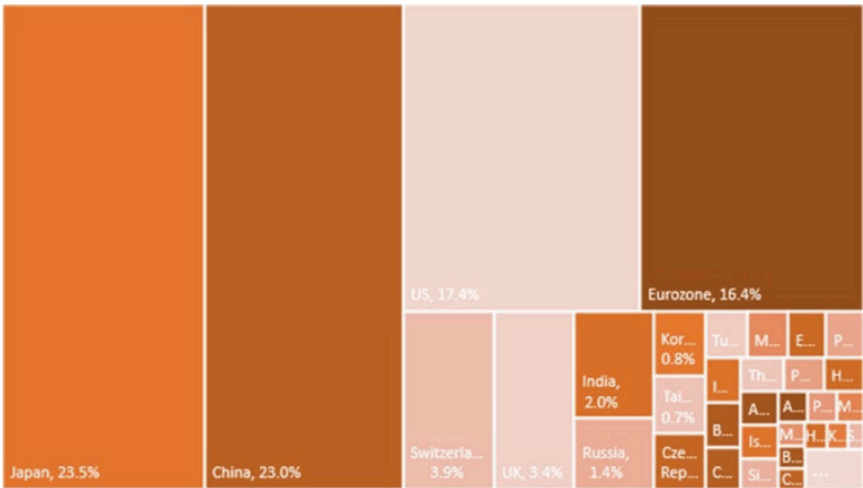


Fig. 7.5 Which are the biggest Central Banks? end-2019 (percent) (Source CrossBorder Capital)

The composition of these balance sheets are also very important. The asset side of the Balance sheets consist of:

- 1) Gold and Foreign exchange(FX) reserves
- 2) Directed Lending programmes
- 3) Securities' holdings

The liability side, on the other hand, consists of:

- a) Cash-in-circulation
- b) banks' reserves held at the Central Bank
- c) reverse repos(in the US case, these are also held by foreign Central Banks)
- d) Treasury balances.

Assuming that (a) or the cash-in-circulation responds passively to retail demands for notes and coins, then movements in any of the other six categories will define a change in national monetary conditions.

Furthermore, in the more mature financial systems that span the Developed Economies, movements in gold and FX holdings are not considered to affect monetary conditions because their movements are "sterilized" by active Central Bank operations, but in practice, there are often spillover effects and we noted earlier, the remarkably close correlation between World Forex Reserves and GL.

Sterilization(by the Central Banks) refers to the intention that any changes in the value of the foreign reserves do not subsequently affect the domestic money supply. Yet, it's unclear whether this means money on the Central Bank balance sheet, money in the broader banking system, or the liquidity of the wider wholesale markets? Sterilization has been also used to describe the smoothing out of interest rate fluctuations.

When we refer to Central Bank money, sterilization requires that changes in the foreign reserves are exactly offset in their effect on the monetary base by equivalent changes to other balance sheet categories, such as, Holdings of securities, Treasury balances, and in some cases, Statutory reserve requirements.

32.1 Security holdings represent assets such as Treasury Bonds, notes and bills and some private sector bills. Movements in these are termed Open Market Operations In many cases, these transactions are restricted to secondary markets, with subscription to government new issues, or so called monetisation, usually ruled out for prudential reasons.(Due to reasons such as Loss of Independence between CB/Government Treasury department and higher inflation caused by direct monetization without the required output to offset the change in new money supply)

Following the GFC, the buying of securities was labeled as LSAP, or more popularly, QE. Directed lending policies allow policy-makers to target troubled institutions, such as through the traditional lender of last resort facilities, the Primary Dealer Credit Facility(PDCF) and other similar credit programmes enacted by the FED.

32.2 The Fed focuses on the Treasury Repo market and uses this to control the Fed Funds market(even though they are not direct participants), which is the market for reserves held at the Fed. Repos make up a large part of Central Bank operations.

=> A repo, in this context, is a collateralized loan made by the Central Bank for a specific period(7/14 days for example).

This transaction involves the purchase of qualifying security, such as the 10y Treasury note, from a private sector institution, such as a money dealer. The institution is buying the security back at the end of the period.

The opposite operation, or the Reverse repo:

=> this occurs on the Liabilities side of the Central Banks' balance sheet. The CB sells a bond into the markets, with an agreement to buy it back on contract expiry.

Repo operations increase liquidity, whereas the opposite, or the Reverse repo, reduces liquidity.

Central Bank operations differ both by their maturity spectrum, by their size and scope through the cycle. The Fed plays the most influential role of any bank. However they are not directly involved in the offshore Eurodollar markets, or the World's most liquidity short-term dollar market, a ready alternative source for Fed Funds. In both the wider repo and Eurodollar markets, the private sector is largely outside of Fed control and hence a source of potentially greater elasticity in liquidity. But in crises, liquidity loses fungibility as it is often hoarded, and, however the Central Banks push, funding liquidity is not easily transformed into the required market liquidity.

32.3 Treasury deposits are the working balances that the government holds at the Central Bank. They are the difference between payments made by the government departments and receipts from taxes and security issuance. Reserve requirements refer to the amounts that designated, regulated commercial banks are forced to hold as reserves at the Central Bank.

Historically, they are measured as a percentage of specified deposits, sometimes with rates varying for different deposit types, and after the GFC, the banks are "forced" to hold reserves above this minimum.

32.4 The deregulation of financial markets has progressively led to a greater emphasis on bank capital requirements. Ahead of the GFC, this encouraged financial innovators to try to sidestep these regulations on capital requirements by splitting financing activity into three distinct functions:

- (1) Liquidity to facilitate refinancing and enable trade, or the supply of notes and coin and cheque clearing functions
- (2) Maturity transformation to allow long-term lending(borrow short-term/lend long-term)
- (3) Credit enhancement to boost risk taking

We can assume that Central Banks identified these. So the assets that the Central Bank holds on their balance sheet can be broken down to reflect their support for these three dimensions mentioned above.

- The Fed has supported these channels thru the QE1, QE2, QE3(after the GFC). The Fed operated, at different times, along all three channels (1,2,3)
- BoE generally replaced maturity transformation with liquidity provision (2)
- ECB focussed more on credit enhancement (3)
- BoJ on maturity transformation (2)

Taking a look on the Fed operations, being the most important, we can see that for example, the LSAP not only substantially increased the size of the Fed's balance sheet, but it also changed the composition of it, by replacing Treasury bills holdings entirely with long-dated Treasuries and adding sizeable holdings of mortgage-backed securities and agency debt.

US\$ billions	Assets		Liabilities	
(a) Reported				
Bills	0	Currency		1342
Bonds and notes	2461	Reverse repos		346
MBS and agencies	1777	Reserves		2575
Other	305	Other		280
Total	4543	Total		4543
US\$ billions	Assets		Liabilities	
(b) Reallocated by function				
Notional bills/ wholesale funds	4263	Currency, repos and reserves	4263	Liquidity provision (50.1%)
Bonds and notes	2461	Notional bills/ wholesale funds	2461	Maturity transfor- mation (28.9%)
MBS and agencies	1777	Bonds and notes	1777	Credit enhance- ment (20.9%)
Total	8501	Total	8501	

Source US Federal Reserve, *CrossBorder Capital*

We can use the information above (about the dimensions) to disaggregate the Fed balance sheet by activity. We denote the assets that contribute to the stock of reserve money as “Liquidity provision”; assets, such as holdings of long-dated Treasuries, that absorb duration from the market, as “maturity transformation”; and the assets that reduce outstanding credit risk for the private sector as “credit enhancement”.

Example of “credit enhancement” is the purchase of MBS and support for the government sponsored entities(GSEs), namely Fannie Mac/Freddie Mac; cash injections into AIG or the American International group and the various associated transactions.

- MBS are instruments, which securitised mortgage pools and are engineered to have credit ratings. Basically an institution(bank/gov. agency) takes all kinds of different mortgages(commercial/residential) and pools them into a security that can be invested into. Typically you can buy fractions of these pools. The intent is to distribute risk among investors, i.e. even if somebody/couple of entities default/s you are sharing risk with the other investors in this pool.

In 2008, this made them Repo-able and eligible to collateralize other securities, such as Asset-Backed commercial Paper(ABCP), which are additionally backed by credit lines from banks. Before the GFC, these securities were often held in the off-balance-sheet subsidiaries of major banks from where they could sidestep capital requirements, but readily attract funding. By divorcing credit funding from credit risk, the financial system created a new class of triple-A rated securities that were deemed as “safe”.

32.5 Significance of collateral for credit expansion and the three tiers of collateral according to quality:
Highest to Lowest;

- D) Banks deposits at the Central Bank
- C1) Good collateral that can be easily converted into D tier, without any haircuts
- C2) Collateral that is only good in certain market circumstances.

Only pre-authorised banks are able to convert C1 into D overnight. The ultimate type of collateral can be defined as D+C1.

Adding economic theory to this framework and the dimensions we were talking about earlier can offer some insight into how these channels may affect risk premia between “safe assets”(Cash/gov.bonds) and risky assets(equities, corporate debt and commodities);

1) Liquidity provision channel - this channel should improve the general re-financing climate within the economy, enabling credit spreads and bid-ask spreads to tighten. We assume that the Federal Reserve receives notional three-month bill rates and pays-out overnight rates for these activities. Therefore, more liquidity should directly tighten swap/money market spreads. By facilitating funding and helping to stimulate business, this may also reduce default rates. More illiquid and more risky instruments should benefit more than safe and liquid instruments, such as Treasuries. Treasuries may also partially lose their safety premium as liquidity increases.

2) Maturity transformation channel - this channel operates in two ways:

a) According to theory, the prices of long duration securities are more sensitive than short dated securities to changes in interest rates(duration risk). Therefore, by removing these risky assets from the market, overall risk should diminish.

b) Assuming there are preferred habitat investors, the removal of specific maturities from the market will create scarcity and reduce their term premia. We assume that the Fed receives long maturity and notionally pays-out short-term bill rates. More activity through the maturity channel should narrow this yield spread or term spread.

3) Credit enhancement channel - this channel acts to remove high credit risk securities from the market. This should reduce overall risk. The Fed takes in credit returns and pays-out risk-free long maturity yields. Larger holdings of credit should tighten these spreads. A specific risk associated with mortgages is prepayment risk and by purchasing MBS this risk may be also reduced for investors.

Fed actions and responses to alter the size and composition of its balance sheet seem to be important drivers of risk premia. Duration and Liquidity effect appear to be significant for Treasury term premia and the credit channel may affect the risk premia on corporate bonds.

After page 158 =

1. China seems to be the largest export and user of Dollars (Bigger than US) although US printing the currency.

Due to the trade dynamics in China (exporting/importing in Dollars in majority).

2. High quality public/private sector debt enjoys low "haircuts"(everytime you take debt and put this as collateral it is worth less) and high re-hypothecation.

3. 35% of world trade is financed by banks and in turn 80% of it is denominated in US\$. Given the fact, credit conditions and the supply of dollars play a crucial role in this supply chain activity.

Building/Sustaining these chains are highly finance-intensive activities that make heavy demands both on the working capital resources of firms and on supplies of short-term bank credit.

Due to the use of the Dollars in these chains, the US dollar exchange rate plays a particularly important role as a barometer of the dollar credit conditions faced by firms.

> Lending in dollars = $\uparrow$ when the US dollar is weak and vice-versa.

> Fact is that the supply chain activity tracks dollar financing conditions

= Strong \$ = subdued GVC (Global Value Chain) activity and $\Rightarrow$ lower ratio trade-to-GDP and vice-versa

Note here that the Trade in recent years and the supply chains are quite concentrated around China with it = workers are cheap + exports production are quite important for the economy

4. The dominance of Dollars in cross-border financial markets means that the central role in generating cycles in World trade and international finance.

> Weak D\$ = QE

> Strong D\$ = QT

4.1 Transmissions of US dollar shocks involve 3 main factors:

a) Emerging Market policy Response - economies that target the US dollar ER will likely respond by monetising Capital Inflows and amplifying the initial shocks thru a domestic monetary expansion and vice-versa

b) Offshore Borrowing - to the extent that any extra supply of \$\$\$ is deposited in offshore wholesale markets (EURODOLLAR markets) should improve overall funding opportunities thru loans + swaps

c) Collateral Effect - Fall in the denominator (US\$) improves the nominator, so it increases the funding opportunities further

$\wedge \Rightarrow$ Thru b + c, operates through the balance sheets of global financial intermediaries.

Fluctuations in the US currency may directly affect the risk appetite of Lenders/Investors.

- borrowing when the Denominator devalues (US\$) becomes more attractive because the repayment costs fall and vice-versa

- similarly, when lenders offer US dollar loans collateralized against a local currency asset, a weaker US\$ improves collateral values and vice-versa

$\Rightarrow$ It follows that cycles in World Trade and global finance are in large part dollar cycles ***

Yet it's true that the US currency is affected by third-party effects, so as GL grows so the demand for US dollar safe assets is satisfied by other units, and hence the US unit can weaken independent of movements in the amount of L supplies by the US Fed Reserve.

4.2 Second feature of this US dollar-led, global financial system is the frequent large-sized capital shifts between the US dollar "core" and economies on the periphery.

- The Periphery economies changed drastically from G7 economies to other EM economies, most notably China.

- Although China is now being considered a "Competitive Threat" to the US dominance, its major use of Dollars makes her just another USER of dollars and thus helping the US dominance to increase and sustain the Dollar System.

=> Not only does she invoice trades in Dollars, she is also a large investor in US Gov. Debt securities and a sizable borrower of the US currency, as well as delivering her fiscal and monetary policy boosts to support the Dollar-oriented world trading system.

5. The US dollar's importance in pricing of both World Trade and World capital means that US dollar shocks are quickly propagated internationally.

- Many EM and most notably China either fix or at least shadow the US\$ ER, so that US monetary E/T are often amplified by these economies.

- Dollar based carry trades also further reinforce the effects of GL through cross-border capital flows.

5.1 Divergence between sluggish domestic deposit growth and the more rapid credit growth = gap forced banks through short-term borrowings on international interbank and money markets and by issuing bonds. These shifts in bank funding patterns across Europe and the associated growth in cross-border bank-related financial flows highlights a systematic relationship between international capital flows which = domestic credit growth. Same goes for EM economies.

5.2 When FED Reserve and the PBoC tighten monetary policy, not only do their domestic stats all shrink, but there are significant second-round effects on Global financial markets

=> E.g., sensitive international asset prices plunge, risk spreads widen, cross-border capital flows skid lower and leverage shrinks in both offshore wholesale lending markets and eventually across global banks.

=> these effects can be spread further by global banks borrowing from offshore wholesale markets, in, say, LON/NY, and lending on to local and regional banks in the EM. Their loans are likely to be secured against, probably, local currency-denominated collateral which when Denominated originally in US\$, the potential currency mismatch can heighten risks and also goes vice-versa.

- Differences between total inflows/total outflows are financed by changes in a country's holdings of foreign exchange reserves, i.e. official flows.

=> Which implements that we need to distinguish what exactly is meant by *gross* because for example a domestic Inv. Fund resident in the US may buy 100m\$ of UK equities and sell 80m\$ of German equities, thereby adding an incremental 20m\$ to US foreign assets. This latter figure is what we take as the gross(asset) flow, but it plainly disguises the 180m\$ of international equity transactions they took.

=> At a higher level of aggregation, we may also find that because foreigners simultaneously added 150m\$ to their US assets, raising America's foreign liabilities equivalently, the net US international inc. position deteriorated by a net outflow of 130\$M (i.e. $-130 = 20 - 150$)

= These movements in asset/liabilities flows may roughly offset one another so that net capital flows become small and insignificant, but gross asset/liabilities flows could still be large.

Moreover, distinguishing gross flows by time identifies risk-seeking, entrepreneurial and more tech-embedded capital flows, compared to the risk-averse capital in search of safety.

=> The first classes are more likely to promote faster economic growth.

(5.2) Overall note is that, when we net things out we lose a lot of information and what's more, is that these capital flows may actively drive the current account, rather than passively accommodating it.

6. Due to popular belief (thru textbooks most probably) an appreciation of Nation's currency is predicted to cause a net export contraction, but in reality it leads to the opposite, since rising ER often run in parallel with strong capital inflows and accelerating economic activity.

7. Private sector is often responsible for cross-border spillovers of liquidity, because financial institutions frequently span different countries and operate across multiple currencies

=> although its main purpose is to promote growth and efficiency, it comes at the cost of sometimes violent cycles of leveraging and deleveraging.

=> rapidly moving cross-border flows are affected by the availability and cost of US Dollars(the main international funding currency)

=> what's more, they can travel across national borders even when net capital flows are themselves small because *GROSS* flows will still affect the *OVERALL BALANCE SHEET SIZE* of the financial sector *!?!*!?!*

^= "US is the main exporter of risk-seeking capital, while EM are the main exported of risk-averse capital"

8. China's private sector does a poor job of "recycling" inward capital.

=> China's foreign liabilities are largely risk assets, such as FDI, whereas her foreign assets are dominated by safe assets. Which is contrary to more mature economies (UK, Germany, UK, Japan) where, the private sector undertakes a greater role thru its international investments at pace at least twice that of China

=> these gaps suggest, the absence of [1] - Domestic sovereign bond market with reserve currency status that foreigners can freely invest in

[2] - An International market

in RMB-denominated trade credit

=> China needs to attract more foreign capital. Keep the yuan depreciating (so the exports don't suffer).

=> High-yield domestic bond market could potentially attract foreign investors which she has but lacks transparency and liquidity

=> demanding payment for goods and assets in Yuan and encouraging foreigners to use Yuan is a straightforward way to increase Chinese wealth, at the cost (negligible) of printing paper money or introducing bigger adoption of a Digital-Yuan (which she already has domestically)(Alipay,Wechat)

=> Selling the Bonds(other assets in general) Yuan denominated will encourage them to borrow more Yuan, similarly pricing exports in Yuan will lead to the development of a much-needed Yuan-based trade credit market.

9. Monetary transmission =

- Rising real ER follows positive capital flow shocks (that are sometimes induced by productivity factors)

=> fast-growing EM economies are likely to experience upward pressure on their real ER.

^Real exchange rate consists of nominal ER and a relative price level - However we do not restrict ourselves only to high street prices and instead define this *Price* level broadly to include asset prices, as well as wages and service sector prices.

^^ In a supply-chain dominated world, we can assume that most goods prices are determined internationally, while wages tend to be sticky due to resistance to pass costs along the chain.

- SO, An increase in the Real ER therefore implies that either the nominal ER can rise; domestic asset prices can rise, or there is a combo of both

=> Due to this when monetary authorities try to keep the nominal ER at stable levels(so we remove one of the variables before), therefore a rise in *Asset* prices occur.

Which explains the high productivity growth economies that often enjoy large asset price gains and often include speculative funds chasing investments in RE developments.

- The initial liquidity shock(the spurs this move) is usually faster export growth and/or stronger capital flows.

- Resulting forex reserve changes (due to the capital flows or exports which are again forex flows) are transmitted thru the monetary base and in turn on the broader credit aggregates(such as overall bank lending)

=> E.g., when capital inflows are translated into local currencies by the CB and accumulated as foreign exchange reserves, the resulting increase in base money can provide new funding for more multiple expansion in bank credit. <=> equally domestic private banks can engage in, say, forex swaps to gain extra funding, with greater confidence in the stability of the currency regime.

^^^These mechanisms, which can also work in reverse, apply unless local policy-makers sterilize the effects of the changes in base money by offsetting actions thru (such as) CB buying/selling of other financial assets. Yet such actions are less able to fully sterilize the effects of cross-border capital flows because these economies are emergent economies and with underdeveloped financial markets.

=> the US dollar amplifies these effects on both sides or/and often starts these cycles of Boom/Busts

10. Capital flows into the non-Chinese EM could be attracted by expectations of better regional prospects following an expansion of the Chinese Economy (China EM proxy?)

=>A push factor, namely US monetary policy may explain both. = Looser US monetary stance could 'push' US capital into EM which in the same time could force the PBoC to match with US in order to maintain the YUAN/US ER parity. = Yet this claim is statistically weaker

*Notes: Gross flows and analyzing the entire foreign balance sheet are important tools that help us understand EM flows

*Act of benchmarking national currency against the US\$ leads to a procyclical and essentially volatile EM investment cycle

*This is no helped by the capitol push from US and pull from being associated with the fast-growing Chinese economy

11. An upswing in credit and liquidity provision typically drives the value of assets, which feeds into itself when the value of collateral(of these assets) essentially is increased, so the private sector can borrow even more credit until, at some point, the cycle tops-out and reverses.

11.1 Markets are moved by the change of the risk-taking behavior of investors and the Inflows/Outflows of liquidity which both affect "Risk premia"

=> when there is low liquidity, Risk premia is higher

=> when is abundant, the risk-sharers i.e. (Financial intermediaries), provide assets with lower Risk Premia, or put another way

"The greater the size of their balance sheets, the more risk they can take on"

=>Hence, More Liquidity = bigger intermediary balance sheets = more risk-sharing
= less system-wide risk

11.2 "Financial liquidity explicitly drives investors' risk appetite and, hence, asset allocation" => Rising collateral values then positively feedback to underpin new liquidity creation (Non-high-street inflation = Monetary inflation)

=> While financial liquidity is usually necessary for an asset boom, it is not always enough by itself, because bull markets typically need a fundamental theme (Meta/Narrative) to "Stimulate and Sustain" investor interest.

^Income Elasticity of Demand = it measures the responsiveness of the quantity demanded of a good or service to changes in income levels.(Percentage Change in Q demanded / percentage change in income =)

=> Economists consider financial assets as "Luxury goods" because as Income levels rise, people tend to spend more on Luxury goods which in these case are financial assets

^"Financial interrelations ratio" = Aggregate value of intangible assets(such as value of financial assets) / by the tangible assets (such as GDP or gross national product) as calculated from the national balance sheet.

=> used to measure the density of an economy's financial structure and the relative rates of growth between its financial assets and tangible wealth

11.3 Due to the structure of Pension funds and similar financial entities(insurance businesses) and their growth/size, so the demand for longer-dated assets increase(if you subscribe at age 20 and retire at 65, the pension fund needs 45 year maturity asset to match this liability)

=> On top of these secular forces that are connected to long-term liabilities, we must add cyclical ones linked to investors' sentiment and attitude towards risk-taking.

=> consequently, as investors' mood changes from pessimism to optimism they lengthen their investment horizons and they are prepared to discount prospects for profitability further out in the future and vice-versa

=> so we should not expect the asset composition of a country to stand still, but rather to both increase towards a longer term structure over time and to cycle around this trend as investors' mood changes =

"The demand for appropriate asset duration to match expected liabilities is a dominant driver of asset allocations."

- We can measure a economy's overall asset mix in several ways

*From the average duration of its assets; from the split between equities and bond holdings, and from the division between holdings of, "SAFE ASSETS" and risky assets(both are risky in reality)

=> given that cash and gov. bonds tend to be safer and often shorter duration investments, whereas equities and real estate are often longer duration and Riskier

=> Then the central measure of asset allocation then becomes the P/M (price-to-money ratio) where;

-P - market value of risk asset holdings(equities for e.g.)

-M - denotes the pool of liquidity and money holdings

=> High P/M = investors are risk-seeking, then

risk-averse(risk allocated) and vice-versa.

*/ Stan Druckenmiller, told Barron's magazine in a 1988 interview: "Earnings don't move the overall market; it's the Federal Reserve Board.... Focus on the central banks and focus on the movement of liquidity.... Most people in the market are looking for earnings and conventional measures. It's liquidity that moves markets ... the best environment for stocks is a very dull, slow economy that the Federal Reserve */"

$$\Delta P(\text{at time } t) = P(t) / M(t)(\text{P/M RATIO}) \times M(t)$$

- Where (1) changes in the P/M ratio between equities and liquid assets, i.e. the portfolio allocation decision, and (2) changes in the flow of new money, M

=> Further, the P/M ratio, largely depends on 4 factors, the first 3 of which are long-term

- (a) The structure of taxation
- (b) the demographic profile of the economy
- (c) the expected inflation rate, and
- (d) investors' risk appetite

=> in the short-term (Business cycle), when the Long-Term effects are not really changed the only thing that matters is (d)

=> Given that this is a sentiment factor which varies constantly between fear/greed, then the P/m should itself show an overall tendency to mean/trend-revert

*Self Notes: The P/M (investor Power Model) is favored due to

1) it is a more intuitive way of understanding investor behavior because it has a direct association with asset allocation

2) liquidity, a key determinant of investor/market action is easily incorporated

3) the P/M ratio is, in practice, more stable and mean/trend-reverting than the conventional P/E, which in, say, profit recessions can surge higher, because the "E" collapses

^profit recession = period during which, corporate profits decline for consecutive quarters or years, similar to a recession, but focuses more on the earning of businesses

12. Safe assets = derives from the asset's ability to cover expected liabilities.

12.1. More liquidity has potentially large effects on systemic risk by reducing frictions and lowering the odds of default

=> Economic agents usually default not because they are "insolvent" but illiquid***

=> The reduced threat of default implied by a greater availability of liquidity persuades risk-averse investors to cut back on their holdings of safe assets and switch instead towards riskier assets, like equities.

- Due to this when Liquidity is plentiful the demand of risk assets tends to exceed the demand for safe assets, and vice-versa which by itself occurs when there are changes in CB Liquidity provision (E.g. QE), and they operate thru this risk-taking channel affecting the supply and demand for safe assets, hence, bond term premia

=> While the attention of most bond market investors is captured by the Policy rate investors, this is only 1 Factor behind asset returns and by no means the most powerful

=> What matters more is the Entire term structure of interest rate stretching out across future tenors, say 5/10/30y ahead.

=> Expressed thru so-called spot yields, or the average yield on a notional zero-coupon bond, over that time horizon =

This term structure of interest rates at any yield tenor can be thought of:

- 1) A policy rate Expectations component, measuring the average policy rate over that horizon
- 2) and, a term premia that compensates the investor for tying up funds for longer period rather than continuously rolling-over a shorter-term instrument

Thus each spot yield Y_m at time t along the term structure comprises an expected short-term interest rate R_t , over a holding period m plus a nominal term(or bond maturity risk) premium TP_m at time t represents the nominal bond term premium over a holding period m .

12.2 These term premia cover future inflation and market volatility risks, and they include the effect from excess supply/demand for bonds coming from Gov. Policies that for example limit new issuance and/or tighter regulations require more safe assets

=> as systemic risks grow, investors will demand more safe assets = forcing down term premia

12.3 The narrative that CBs control the path of policy rates(using "forward guidance" nowadays), and they themselves can drive down term premia, hence, long-term yields thru the buying of gov. bonds through LSAP(large-scale asset purchases), or QEs.

=> A study shows that (as a broad rule of thumb), asset purchases worth 10% of GDP reduce US10Y yields by around 50-100 bp.

=> This view suggests that a monetary expansion thru rate cuts+QE should mean lower yields across the term structure and probably even lower longer term yield(Flat yield curve)

=> Yet, evidence shows the reverse:

1) (page 226) Chart highlights positive correlation between FED QE periods and US10Y term premia

=> Term premia rise by an average of 135 bp thru the QE and they fall when they expire or turn into QT

2) Explained simply by investors expectations that are coming from the CB signals of their actions

*Notes to self: Pretty obvious in hindsight. They usually implement QT at/before some sort of a Crisis or deterioration in the Financial system.

=> QE(signaling good times ahead, lots of liquidity, risk is less due to the previous statement) => Drop in the demand from investors for safe assets correspondingly

=>QT same but opposite

LSAP policies effectively force the private sector to go from cash to bonds. The reduction therefore in the supply of the bonds to the private sector (due to LSAPs) decreases the amount of outstanding duration risk, and given preferred habitats, also creates scarcity effects that together lower term premia.

HOWEVER, the impact of the announcement for LSAPs/QE combined with the Liquidity that needs to be injected, reduces perceived systemic risk+boosts investors' confidence and encourages them to cut their demand for safe assets.

=> this causes them to drive term premia up as investors become more risk seeking

13. "Demand for safe assets is governed by the threat of systemic risk"

=> One of the reasons is Low levels of liquidity, because:

1) It raises default risks = Corps/Individuals tend to default mostly when illiquid (not necessarily insolvent)

=> Hence, an increase in liquidity by reducing systemic risks leads to a rise in targeted duration (D^*) (investors prolong their targeted durations basically) and a fall in the demand for safe assets

=> this results Higher bond term premia and explains the close connections between Liquidity, term premia and slope of the yield curve

13.1 Central bank interventions, however, can mess up Private sectors, due to the fact that when they buy Gov. bonds as part of their plan to boost liquidity, they also take away precious collateral that is used by Private sectors for their repo funding.

=> consequently, liquidity for private sector expands, but the available long-dated collateral could contract (opposite forces for example), there by leaving the net supply of liquidity uncertain

Notes to self: Private sector can fund their operations thru buying Treasuries and repo-ing them in the market. There is chain of these actions thru all the Private sector entities and these bonds can often be leveraged* like this a couple of times.

1\$ in liquidity is not equal to 1 dollar of Bond can be leveraged sometimes up to 7x

=> Thus, despite a potential reduction in the effective supply of "safe" assets, the net effect, and the effect shown in (Page 228/Fig 10.6.), is a deeper cut in the excess demand for safety (e.g. difference in the targeted duration - current duration or $D^* - D$)

=> LSAP/QE policies are associated with lower net demands for safe assets (high confidence/lots of liquidity) and hence higher bond yields.

= Same goes for QT policies but opposite; falling bond yields, and given that term premia, by definition, make up a progressively larger-and-larger component of yields as bond maturity extends, QE policies necessarily cause yield curves to steepen***

Notes: ^ LSAP/QE policies: When CBs buy assets from the market (in this case bonds) naturally this pushes yields up because investors are competing for the assets that are left (supply curve shift leftwards) thus pushing their Price ^ and Yield v

^ QT policies : Sellings assets = yields down, because of more supply

^ Impact on the yield curve: Term premia is an important part of bond yields, especially for long-term bonds. QE policies, cause bond yields to rise, leading to a steeper yield curve

13.2 The impact on the yield curve affects the real economy also by shifts in the term structure which is used when assessing the viability of long-term projects and because bank profitability often rests on the slope of yield curve***

=> evidence for this on page 229, fig. 10.8/9

= Basically, QE = steepen term structure, and QT = flatter term structure

Put simply, when economic conditions Improve, investors may demand higher returns on their long-term bonds due to increased optimism about future growth. This can lead to steepening.

Conversely, during economic downturns, investors may seek the safety of long-term bonds, causing term premia to decrease and the yield curve to flatten*.

- Although there may be another feedback because low term premia (caused by QT), reflecting Systemic risks/Excess demand for safe assets, can themselves cause prudent policy-makers to further ease monetary conditions.

13.3 Consensus believes that CBs alone set interest rates, but one implication of liquidity analysis is that markets play the leading role, while CBs reach to their movements by trying to keep up with policy rates.

=> Put another way, Long-Term interest rates determine the Short-Term ones ***

^page 230/Table 10.3 shows evidence of this believes thru Granger causality tests

=>More liquidity drives the price of safe assets down, and risk assets up, often in both absolute and relative terms.

14. Contrary to popular believe, Exchange Rates(ERs) depend on the quality mix of:

1)private sector liquidity (good for the ER)

2)central bank liquidity (bad for the ER)

=> CB liquidity represents the additional supply of currency, while this may favor domestic risk assets, extra supply drives the ER down, while private sector liquidity is a measure of an economy's cash flow generation. => Stronger Economic activity should encourage investment and incentivise capital inflows

=> as these are attracted to the currency, ER should appreciate

= Consequently, the difference between private and central bank liquidity is likely to predict future ER movements

= Thats called "Quality theory of money"

15. More liquidity reduces the average level of asset duration(they start to seek shorter-duration assets in the beginning of the easing) available to the private sector and by cutting default rates, cuts the odds of systemic risk.

=> Later, as this increases duration targets thru bigger confidence and cutting default rates, investors prefer Longer-Term assets, with higher yields and higher stability

*Notes to self: investors first prefer(when Easing starts) shorter-term assets which provide better liquidity/safety when there are periods of increased liquidity, but later they transition to longer-term assets as market conditions stabilize and confidence grows, seeking higher returns or longer-term investing opportunities. Thus pushes Risk Assets prices higher (real estate/Equity)

15.1 Real Estate and Liquidity: Research conducted by CBC states that, each 10% point increase in the GLI index(0-100) leads to an approximate 2% annual rise in real estate values, slightly more for commercial buildings and slightly less for housing.

=>Important part is that Liquidity is leading house market by around 3 years(from Liquidity impulse to Real Estate market values)

15.2 Equities: The Positioning of Liquidity (and safe assets in general) within investment portfolios proves to be a major factor behind equity market returns.

=> This implies that there is a "norm", possibly measured by duration, which investors target, which by itself means that changes in risk appetites, relative to this "norm", causes them to shift funds into/out of risk assets.

=> Equities (typically long-duration asset) may, in fact, be marginal or swing asset class

that is used for quick rebalancing = in other words, tensions/imbances in the fixed-income/foreign exchange markets are often expressed thru equities

= This also might explain why it usually pays off to be a contrarian in equity markets by doing the opposite of consensus, when its at most Greed/Fear extremes

=> Asset mixes = mixture of equities, bonds and liquid assets

= While they are differ thru different countries, they appear to be remarkably stable over time with hints of Mean/Trend reversion behavior

=> Deviations from these “norms” thru countries on their targeted allocations will set in motion a rebalancing process

= Three ways that these mixes will change

1) Changes in the relative prices of safe and risky assets

2) Changes in the supply of safe assets

3) Changes in the supply of risky assets

= In practice, usually a combination of these occur

Page 242/Fig. 10.12/13

= They usually overshoot before changing the mixtures which is pushed by the large move upward in the value of equities due to the fact that Risk assets are taking bigger part of the adjustment due to bonds being limited in how much they can move but on the other hand, changes in their supply(safe assets) can be significant.

=> Since the GFC, the supply of safe assets has been constrained by the Central Bank's QTs. On top of this many US corporations have been buying their own shares with cash, which means that the “Behavior” of investors is often more variable than the earnings/dividends that characterize the underlying securities

= Therefore knowing when asset allocations are skewed towards risky assets is likely to anticipate future selling by mass of investors and hence lower equity returns

^Here Michael introduces the R/S = risk to safe assets ratio which is better at explaining future returns than US Shiller CAPE multiple by 30% based on correlation.

16. Top down market analysis is preferred due to the fact that changes in Asset prices are fuelled by changes in liquidity* and investors' risk appetites*

“...the market is not a weighting machine, on which the value of each issue is recorded by an exact and impersonal mechanism, in accordance with its specific qualities. Rather should we say that the market is a voting machine, whereon countless individuals register choices, which are the product partly of reason and partly of emotion”. Graham and Dodd, Security Analysis (1934). We simply add to this that the votes are MONEY.****

16.1 Business cycle tends to follow the liquidity cycle by around 15-20 months. Around 6-9 months after the respective peaks/troughs in the liquidity cycle, the yield curve will typically flatten/steepen.

=> roughly coincident with the business cycle peaks/troughs, investors' risk appetite similarly peaks/troughs, but these tend to be more violent, frequently self-reinforcing and they often touch the extremes of fear/greed

= This means that around a year following the yield curve inflections, the business cycle itself peaks/troughs.

17. Today's world have a global banking and financial system, composed by private firms acting largely independently of their domestic economy's needs

=> Capital Imports do not accurately measure another country's net savings, rather they often represent a credit flow between financial institutions across borders

= For example, UK/US run persistent large current account deficits, which means that they are borrowing, but in reality they are actually providing credit to institutions abroad

=> The GFC crisis was not due to unsustainable Current Account Deficits, but due to unsustainable Balance Sheets, fragility and interconnectedness of Balance Sheets, which led to a major liquidity crisis and systemic collapse, i.e. Global Liquidity Crisis***

17. Standard economics and finance paradigms ignore money and liquidity, although they exist everywhere and at all times.

=> Illiquidity is the biggest issue and without sufficient liquidity there would be a widespread market failure.

=> Illiquidity occurs both when the Supply of money/Credit breaks down and when heightened uncertainty causes investors to hoard "safe" assets

=> EMH, the bedrock of finance theory, does not apply to the real world, due to the real-world imperfect markets (and irrational market participants) and market failures which are common place

17.1 Definition of Global Liquidity is composed by 2 concepts:

1) Funding Liquidity = monetary liquidity measure, defines as the ability to convert monetary assets into goods, financial instruments, both Domestically/Internationally

2) Market Liquidity = financial market depth, defines as the EASE* of trading in assets relative to trading in Money*, and reflecting the COST* of converting an Asset into money (cash)

=> Although Funding Liquidity is more important, both are connected thru Collateral Effects (The collateral is bound to appreciate if its more Liquid in terms of Market Liquidity i.e. you can borrow more on this collateral)

17.2 Key players in Global liquidity are PBoC, US and the cross-border funding markets (e.g. EuroDollars)

=> China manages her vast retail deposits thru bank reserves and accumulates US dollars because of her Trade and foreign direct investment (FDI) invoicing

=> Despite her Large dollar holdings, China primarily manages her economy-wide forex risk thru Re-Exporting dollars rather than her own currency i.e. instead of keeping these dollars, she often send them back throughout the financial system

=> US liquidity relies on WholeSale Money Markets, where Corporate and Institutional cash pools (CICPs) contribute to inflows, include those mentioned above from China and similar sources.

=> These markets characterized by leverage and collateral-based transactions, but face a shortage of safe-assets = which means that they the demand shifts into riskier and longer-maturity assets, as well as less secure credit substitutes

*=> Due to the Interest Rate and regulatory arbitrage, US Dollar wholesale deposits head to EuroDollar markets

=> There US/Emerging market borrowers access funding thru lending activities

= Cross-Border capital inflows into Emerging markets serve as bank collateral and

can be further multiplied by interventions from local Central Banks in forex markets

*Imagine there are markets where people trade US dollars, but not in the US. These are called Eurodollar markets. So, even though the money is in dollars, it's not actually in the US. And guess what? A lot of this money goes back to the US or to other countries to lend to businesses. This can cause even more money to flow into other countries' economies because their central banks often step in to control their own currency's value.

These swings in the liquidity cycle also drive risk appetite, which feedback positively on funding liquidity via market liquidity and amplifies the overall cycle. When all three are combined = Financial Cycle (Page 252/Fig. 11/1)

18. Here, Michael goes on about how the policy-makers nowadays still do not fully understand the connections between its monetary policy and financial markets

=> Main concerns

- 1) Not understanding the need for Balance Sheet capacity to facilitate debt rollover, and their associated
- 2) Failure to supply sufficient safe assets (especially when most needed)

^ "Facilitate debt rollover = making it easier for some entity to repay/refinance their loan when its due

=> Put it simply, they never adapted to the evolving financial structure, further more they promoted the concentration of the financial system, but alongside have demonstrated slow and often "erratic" responses to growing financial tensions

- 1) E.g. the growing worldwide accumulation of debt, as well as its progressive slide in quality
- 2) In the mean time, widespread and uncontrolled use of derivatives, maturity and foreign exchange mismatches, growing securitisation and off-balance sheet financing
- 3) Big casualty is GFC itself, which highlighted the rapacious pace of innovation in financial markets and the big L in the delay of tackling the BNP Paribas fund suspension in 2007 and the short-sighted error made by sanctioning the Lehman bankruptcy which sprout to a systemic failure due to their size
- 4) $\frac{3}{4}$ of America's financial assets are controlled by 10 of the largest financial conglomerates

=> Which raised the term "Too big to Fail", which forces the US authorities to be still more interventionist, so reaching well-beyond their traditional mandates

=> Rather "Too big to Fail", one might use "Too interconnected to fail" which is more accurate description of the situation

18.1 Michael here explains the "interconnectedness" further. Today's finance has inevitably turned to refinancing existing debts, rather than creating new one.

=> Shadow Banks are involved in $\frac{2}{3}$ of the funding, or "re-packaging" existing debt, while they only supply only 15% of new credit, according to IMF estimates

=> What they essentially do is to transform traditional bank assets/liabilities by refinancing them in longer + more complex intermediation chains

= A lends to B, B lends to C, C lends D... to Z

=> Any break in this chain can notionally bankrupt an alphabet of “twenty-six” firms and not just one

=> On top of this, the widespread use of Market-based collateral introduces a hierarchy into liabilities, making the system more procyclical, and more dependent on Central Bank intervention

^Market-based collateral - assets/securities that are accepted as “security” or guarantees in financial transactions, such as loans or derivative contracts, based on their Market Value. Highly Liquid at first sight, because if the borrower defaults you can just sell them, but what if their value goes down and you go Underwater?

=> this ongoing dominance of refinancing over financing makes access to credit lines more important than interest rates and emphasizes that QE/QT are critical policy levers

= You wouldn't care about the Interest Rate up to some degree if this means saving your company but if you literally cannot get to this line of credit your Fucked

=> Ahead of the GFC, securitisation(Market-Based collateral) was widespread, new liquidity came from interbank markets and funding was back-stopped by CDS, not the banks and the State Deposit Guarantees according to textbook models

=> Nowadays this turned to wholesale markets, new liquidity provided by CICPs(corporate and institutional cash pools) and funding is backstopped by sometimes flaky collateral

= The drive for greater financial elasticity, in turn, has fuelled a jump in cross-border flows outside of the realm of US Fed Reserve interest rate+regulatory control, so providing an additional source of leverage = International integration has consequently jumped

18.2 In practice, international financial crises tend to be preceded by build-ups in leverage, with the scale of instability amplified by government austerity policies and by the rise of Shadow Banks/CICPs

=> This appears to confirm the Financial Instability hypothesis of Hyman Minsky that argues that liabilities experience three financing regimes

- 1) Hedged
- 2) Speculative
- 3) Ponzi

*Notes to self: We can kinda relate to the Crypto here. In the beginning we are going hedged by buying into Big projects i.e Total has pushes upwards, later we go into L2s which is Speculative driven by the gains in the Big projects and later we go to the Ponzi i.e. Memecoins which usually marks Local Top/Cycle top based on the overall Gains in Total3

=> Where Hedged is stable for both markets and economies, and speculative/ponzi are unstable

= Speculative need liquidity to allow debt to be rolled over, and Ponzis demand liquidity and rising asset prices. Neither can be guaranteed, and according to Minsky “stability leads to instability” which is fuelled by greed

18.3 The safe asset supply shortfall is induced by Policy-Makers' concerns over their low inflation mandates which encourages private sector initiatives to create substitutes, but these by definition frequently lie beyond the realm of regulation and miss out on State support(when needed)

=> Furthermore, there private sector instruments are highly procyclical, which are missing when they are most needed and abundant in good times

=> While Policy-Makers' are pushing investors towards safe assets, they fail to supply enough of them and then having to hastily react and bailout the system which ends-up creating moral hazards by

making Risky investments safe("Oh don't worry, they gon bail us out man"), all while making safe assets turn out to be the most dangerous

There is a worldwide shortage of Safe Assets. Every financial crisis, it seems, involves some form of failure of these same assets. John Keynes puts it slightly differently by pointing out that there cannot be a thing such as liquidity for the investment community, someone HAS to take on the Risk*

This shortage is further amplified when Central Banks conduct LSAP(Large-scale asset purchases) which takes out this "precious" collateral(US Treasury debt and their international equivalents)

=> Critical part here: Safe asset can be instantly turned into legal tender without discount, but with the difference(to Liquidity) that the time horizon is adjusted to match the asset owners' expected liabilities, whereas a non-safe asset may not match expected liabilities, either in their size (solvency problem) or in the pattern of cash needs over time(liquidity problem)

= This mismatch can be expressed thru the finance concept of Duration(Effective time horizon of the investment)

= Like Maturity, Duration is usually measure in years and the yield premium on this said asset may partly compensate for this timing mismatch(or illiquidity taken thru this duration)

=> The most important price in the financial system is the price of the dominant economy's sovereign debt which currently is the US Treasury + the value of the US dollar. Which makes the US10Y the "safe asset" of choice, because it matches most duration of liabilities, such as future pension pay-outs, than, say, cash

= Textbooks tend to think in terms of cash, as the main safe asset, while the fast-growing CICPs arguably favor a US dollar-denominated instrument of somewhat shorter maturity.

19. Asset allocators actively decide the mixture between safe/risky assets

= Balance is require

= It changes thru the business cycle, but ultimately it should mean-revert to a level determined by expected Future liabilities

=> These Liabilities depend on long-term factors such as Demographics, taxation, underlying inflation and risk aversion

=> Here Michael introduces a chart of US and World investors market value of equity to safe asset ratio (page 259/Fig. 11.3)

19.1 Additionally on Safe assets:

=> As states previously, "Safe Asset" can be defined from its ability to cover expected liabilities

=> IMF defines it as a financial instrument that provides

- 1) Low market and credit risks
- 2) High market liquidity
- 3) Limited inflation risks
- 4) low exchange rate risks
- 5) limited idiosyncratic risks

=> In practice, Safe Assets involve Geopolitical and psychological factors, such as trust and believe = "Safe asset" is considered safe if others agree.

19.2 History of safe assets shows that they share several properties

- 1) Safe assets tend to rise in value thru economic headwinds, whereas riskier assets perform

less well, i.e. Safe assets have a negative beta to the market

2) Deep and liquid markets with the ability to trade in large sizes around prevailing prices.

= It follows that capital controls can deny safe asset status

3) Consistently lower yields than other assets

=Research on this estimate that US Treasury yields are around 70 bps lower on average because of their safety and liquidity features

4) Greater Fiscal capacity, as measured, say, by the low sensitivity to yields to an increase in the debt-to-GDP ratio, and backing of US military(page 259/260 at the bottom/top of the page, respectfully)

19.2 There is a shortage of Safe assets around the world and this matters greatly, due to the fact that prevailing wholesale money market-based system essentially depends upon a steady supply of fresh collateral

=> Although CICPs provide sources of new funding, they demand liquid, collateralized savings instruments which the financial system provides through repos.

= This rise of CICPs and their growth has consequently boosted repo demand, hence, furthered collateral needs.

=> This Shortage has forced a large part of this institutional cash into collateralized and often newly minted private sector instruments.

Example of this here, would be GFC. Banks through this time faced largely unknown borrowers while facing huge maturity risks. Even though markets were deemed deep and liquid the 2007-2008y proved this not to be a reliable constant.

Shadow Bankers were borrowing short-term(7-14 days often) and lending long-term for sometimes up to 30y! Which basically means that a borrower with a 30y loan, was supported by this bank by 14-day bills, which needs to be refinanced 778 times up to its maturity. This huge refinancing burden provides plenty of opportunities for something to go wrong, and it did.

In the decade after the GFC, the structural shortage of safe assets has been met by money markets repo'ing high quality collateral, such as Treasury Notes and high-grade corporate bonds. However, the limited supplies of government securities have added pressure on corporations to issue more debt. US capital markets have benefited from this, but not only because US dollar assets are in particular demand, but also because the US has the largest and most liquid corporate bond market Worldwide.

=> Consequently of this, US credit spreads have narrowed and issuance by US corporations has risen strongly

=>Low prevailing capital expenditure needs have meant that much of this cash has been pushed into Wall Street equities, thru buy-backs, thereby lifting stock prices

= Correlation between debt issuance and stock buy-backs is shown in page 263/Fig. 11.5

=> In the meantime, equity retirements have regularly averaged a net 1-2% of total US market cap. Over the past decade, so diminishing the available pool of equity

19.3 This all comes at a cost.

=> This collateral-based mechanism for liquidity creation is highly procyclical due to the fact that quantity of new liquidity created rests heavily on the quality of available corporate debt, which, in turn, depends on the state of the business cycle

=> This linkage warns that widening credit spreads can have outsized effect on the provision of liquidity.

=> It is also potentially fragile, because the repo system could itself breakdown if corporate default risk increase, so driving investors into the safety of already scarce government bonds

One solution to this is to force the Treasury to issue long-term debt (30y - 100y). QE are simply not enough. Replacing government bonds with, say, FED Reserve Notes are far less effective because they soak up collateral. Policy-Makers need to increase the balance sheet, Treasury and FED reserve liabilities, and invent more methods to free up collateral for the wholesale markets.

20. Here Michael explains how Capital has been steadily moving towards Asia and looks to settle between India/China by the year 2050

=> Capital is indeed going after Growth, and Growth has been progressively going up in Asian Countries

=> This reflects the Need Of Capital In these countries relative to their sizeable investment opportunities

20.1 In many ways, The Top 500 US corporations have been leading this global capital shifts, i.e. globalization

=> Although headquartered in the US, they outsource anywhere in the World where components are cheapest and labor skills greatest, and they shift their profits anywhere where Taxes are lowest

=> Contrast this with China, where State-Owned-Enterprises (SOEs) make up her industrial core. They borrow from SOBs (State-Owned Banks) at artificially low-rates, have preferential access to government contracts, and the SOEs and SOBs are used as convenient policy levers to balance the economy, lending and spending when private companies are less willing to do so.

=> They are also key engines of economic growth by undertaking the necessary capital-intensive investments

20.2 Capitalism requires vast inflows of industrial and financial capital, and many top US corporations have been consequently been among the quickest to expand their Chinese operations

=> Main conduit for these inward capital flows is FDI - foreign direct investment

FDI consists of tangible investments in plant, equipment, buildings and businesses located outside of the domestic economy. Currently the Emerging Markets and Frontier Markets are consistently large net recipients of outflows from the developed economies.

FDI tends to embody the latest technologies and management skills. This means that*** **it's a major driver of growth across China and Emerging Markets**

=> Net FDI suppliers are China, for Asia, and Germany, for Europe

21. Source of Global Liquidity data:

=> Supranational Organisations, such as the International Monetary Fund (IMF), the United Nations (UN) and the Bank for International Settlements (BIS)

=> National Treasuries and Central Banks, e.g. US Federal Reserve, People's Bank of China, ECB

=> Trade Organisations, major lending corporations, money markets and shadow banks.

The index composed from these data sources can be shown to be Granger causal for many key economic/financial data series and typically precede important asset price moves

Indexes tend to lead:

- Bond/Forex markets by 3-6 months
- Equity by 6-12 months
- Real economies by 15-20 months

The data covered in these indexes consists of baskets of z-scores("normalized"), sampling around "30" data series per economy and covering:

- Traditional banks
- Central banks
- Shadow Banks
- Corporations
- Households and foreign investors

Data is then cleaned, cross-checked and assembled into a standard template to facilitate geographic and historic comparisons

Additionally, there are six types of variables that you can include as data:

1) Asset prices and credit costs - Excluded because its non-predictive, apart from very short-term credit spreads such as LIBOR-OIS and TED which are used largely to cross-check the flow data

2) Credit spread/Risk premia

3) Leverage and credit growth

4) Off-balance sheet lending (e.g. shadow banks, securitisation)

5) Lending surveys - Excluded because its non-predictive and has long-lag

6) Security new issuance data and ETF and mutual fund flows - Excluded because its non-predictive

*Preferred data points by CBC are 3/4/2 and specifically:

- Growth rates in the volume of Broad Credit/Financial Savings
- Growth rates in the size of Central Bank balance sheets
- Net inflows of cross-border financial capital relative to the size of the domestic liquidity pool
- Leverage ratios of private credit providers
- Short-term credit spreads in money markets

These indexes are trend-adjusted: they are measured relative to current economic activity, and they are more comprehensive because they include certain key balance sheet ratios that plainly cannot be expressed as quantities. They also implicitly incorporate monetary velocity - the speed at which money changes hands in an economy.

21.1 CBC is using monthly data, because the problem of gathering lots of variables is that the sample could become lop-sided, including too many of a readily available type that correspondingly bias as the index in a certain direction and so "over signal" the index.

=> This problem is further mitigated by grouping variables by types, e.g. Central Bank Liquidity, CBC flows, and by considering the statistically significant number of around thirty different variables by economy

=> The data components that make up each sub-index are detrended and volatility-adjusted to ensure stationarity

The resulting GLI consist of “normalized” growth rates* and balance sheet ratios.

=> Idea behind is that financial markets respond to shocks, which are scaled according to their standard deviation.

=> Investors will grow accustomed to a steady flow of liquidity, but react when growth rates suddenly change

Page 278 shows the footprint of the TPI*****

=> Additionally, the choices of how to weight these sub-indexes comes down to 2 options:

1) Size-based weights - determined by the outstanding stock of liquidity in each category
2) Weights dependent on data performance - typically means either regression-based loadings determined by the correlation of the components to a target data series, or principal components where the weights are determined by their contribution to the first principal component of common variation in the data

= Here CBC prefers a combination of both the principal component weights and weights determined by the outstanding stock of liquidity.

This gives Central Bank liquidity a higher loading in the index than its size-weighting alone would merit