The Macroeconomics of Debt

Europe's blind spot

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FOREWORD

It is a pleasure to present this latest edition to the collection of important contributions by Anton Brender, Florence Pisani and Émile Gagna. In this volume they implicitly revisit themes discussed in previous work, namely the key role of the financial system in transferring the savings of households to investors and in spreading the unavoidable risks.

In *Money, Finance and the Real Economy: what went wrong?* (2015), they looked at the dual role of the public sector as the provider of the ultimate riskless asset and, at the same time, the source of a potential major systemic risk. In this latest contribution, they focus on the first aspect.

The starting point of the analysis is the observation that government debt ratios relative to GDP had been climbing even before the Covid-19 pandemic struck. When the economy tanked under the lockdown imposed in 2020, governments everywhere felt forced to run very large deficits to support workers who had lost their jobs. This led to another uptick in debt ratios of close to 20 percentage points of GDP in many countries. However, interest rates continue to remain close to zero although this latest bout of deficit spending brings debt ratios to levels seen historically only after major wars.

Brender, Pisani & Gagna emphasise the fact that households demand debt for their savings and argue that, in mature economies, the corporate sector simply does not provide enough of it. The financial sector also cannot be a *net* source of safe assets since it is also owned by households, and banks must balance their assets and liabilities. Some households are willing to indebt themselves to buy a house. But they show that their capacity to indebt themselves is limited. This leaves the government as the only possible provider of enough debt to satisfy an increasing demand for debt instruments from households.

The authors conclude that when households want to save more, the government must provide the bonds households demand, otherwise the economy cannot reach full employment. The reader is invited to follow their reasoning and find out whether what appears to be fiscal profligacy to many is indeed only a reaction to an ever-increasing demand for government debt.

Daniel Gros
Member of the Board and Distinguished Fellow
Brussels, August 2021

INTRODUCTION

Around the globe, debt continues to grow, regularly creating cause for concern. Are today's economies really nothing but a house of cards? The Covid-19 pandemic has not helped matters: the debt of most Western governments has soared as a result. Nearly everywhere, the boundaries put in place by circumspect European Treaties or resulting from lessons learned from centuries of financial history (Reinhart & Rogoff, 2010) have clearly been breached. Will our governments go bankrupt? And who will foot the bill?

This book aims to tackle these questions and clarify why, rather than resign ourselves to ever-growing debt, we should seize the opportunities debt can offer and strive to deal with related risks. While debt can indeed be a catalyst for crisis, it is also crucial to economic growth, for the simple reason that one person's debt liability is another's debt claim. When an economy grows, households save and most of those savings lead to an accumulation of debt investments. If nobody borrows, then nobody can set money aside and the economy, as Keynes has shown, will stagnate or, worse, contract. In a market economy, Aesop's fable does not hold true: the ants need the grasshoppers.

Some may find this surprising. Savings are almost universally seen as a virtue, while debt has been tarnished by the long history of servitude and violence it has caused (Graeber, 2011). Islam still forbids lending money at interest, while the Church, after much deliberation, now allows such practices, provided rates are not usurious. Be that as it may, getting into debt has long been (and in some cases still is) synonymous with guilt. Such notions live on in our everyday language: an oft-cited example is the German word for debt, which also means 'fault'; a less common illustration is the English verb 'redeem', which applies to both debts and sins. In modern economies, savings and debt have become inextricably linked. The burgeoning debt seen in societies that offer improved living standards is the flip side of an accumulation of savings. China is an outstanding example: the unprecedented speed at which liabilities have been piling up there for more than 10 years mirrors a particularly rapid increase in the financial assets of households.

Our economies clearly do not follow the moral of the fable: virtue and weakness are two sides of the same coin. This inherent ambiguity is why we have trouble seeing the expansion of debt as a reflection of our wealth. The connection between the two has indeed grown somewhat opaque. The fact that financial systems now serve as an intermediary between lenders and borrowers has made the link between the two less direct and harder to detect. On the one hand, financial institutions lend money they have not saved; on the other, households invest the money they have saved … often oblivious to the fact it is lent. Our journey therefore begins with a quick overview of the architecture of modern-day financial systems. They provide the microfoundations of credit: they receive money that is not spent; they gather information and take decisions that govern the distribution of credit. A lending transaction is a risky endeavour for both borrower and lender, which is precisely where financial systems play their part, by assessing these risks and helping to manage and carry them (chapter 1).

Left to their own devices, and despite their growing complexity, these systems are nonetheless unable to maintain a satisfactory macroeconomic equilibrium. The banks that form the cornerstone of these systems create the money that circulates in the economy through their credit. However, the amount of credit they provide need not be exactly what is necessary to keep the economy at full employment: if banks grant too much credit, then prices will drift upwards; if they do not grant enough, then the economy will not produce all that it is capable of. Over the decades, central banks have learned to use interest rates to tailor the amount of lending to demand for debt investments. By lowering or raising rates, they aim to increase or reduce demand for credit from private agents. Naturally, these agents must be responsive to such impulses. For more than a decade, the rock-bottom rates found in most developed economies have proven this is anything but a given (chapter 2).

The image of debt as a necessary counterpart to demand for debt investments is often masked by the frequently spectacular spikes in borrowing, which almost just as frequently lead to crises. The pace of lending is clearly affected by the level of interest rates, but because each loan entails a certain level of risk, this trend also depends on attitudes to risk on the part of both lenders and borrowers. Recurrent shifts in such attitudes appear to imbue debt with its own dynamics, independent of

those governing the accumulation of debt investments. Still, on closer inspection, behind the waves of debt seen over the past half century in emerging economies and advanced economies, there is always a surge in savings somewhere in the world. And the corresponding wave of debt has served to meet the demand for debt investments resulting from this surge, thus ensuring the economy could continue to grow, at least for a while (chapter 3).

An analysis of the counterparts to the financial wealth of households in the world's advanced economies reveals this intimate link between the hitherto continuous expansion of their financial assets and growth in the stock of accumulated debt investments. Obviously, the wealth of households also includes the value of the companies they directly or indirectly own. This value is nonetheless more a result of the profits these companies have retained than of the savings households as a whole have invested. The flow of investments that grows households' financial assets year after year almost exclusively leads to demand for debt investments. Yet the debt issued by companies does little to meet this demand. For the most part, private debt that serves as a counterpart to the claims held by households is issued to finance … loans to other households. In nearly all developed economies, when household debt has not increased sufficiently, or has dropped, more public debt has been needed to keep those economies from straying too far from full employment (chapter 4).

The limits to private debt need not necessarily be consistent with the demand for debt investments resulting from growth in the financial wealth of households. First, the counterpart to this wealth can only come from the debt of companies *net* of any debt claims they hold. The amount of this net debt cannot normally exceed the value of the stock of productive capital companies have acquired. This stock today represents only a fraction of household assets and its acquisition has for the most part been financed by retained earnings. Second, household debt is limited by household income. Banks will normally only lend to households whose income is likely to allow them to service their debt. This debt service is of course affected by the length and cost of borrowing. But when mortgages run for several decades and interest rates are way down while house prices are sky high, household debt soon hits a limit (chapter 5)!

When this happens, only the intervention of 'borrowers of last resort' – in this case, governments – can prevent the economy from grinding to a halt. Central banks urge them to do so by keeping interest rates low. As long as households want to save more than private agents are willing to borrow, governments not only can but should continue to take on debt. They are indeed not just borrowers; they are also 'insurers of last resort' for

the people who live in their country. Faced with a future fraught with risks, borrowing gives them a means to invest today in a bid to avert at least some of those risks and avoid taking on even more debt tomorrow. Far from allowing governments to be more reckless, their growing debt requires them to be more prudent. If they use their resources wisely, they will not go bankrupt (chapter 6).

1. THE MICROFOUNDATIONS OF CREDIT

The debt that arises from a credit transaction represents a commitment to pay an amount of money to someone at some point in the future. The transaction may be commercial in nature, as when a baker does not pay immediately for the flour he has just received and is indebted to his supplier, or financial, as in the case of a company that arranges a bank loan to buy a new machine. These credit transactions and the debt they entail have become crucial to the workings of today's economies. They provide a means of easing the particularly rigid constraints that income would otherwise impose on an individual's expenditure. In a debt-free economy, agents would be forever bound to spend no more and no less than they earn. These limitations would of course weigh heavily on those wishing to temporarily spend more than their income allows.

Yet these same restrictions would also weigh on those seeking to set aside a portion of their income. This is an important point. Given that one person's expenditure is another's source of income, if no one is able to spend more than they earn, then no one is able to spend less. Gone are the days of hoarding gold coins: modern-day money is, as we shall see, *credit money*; the yellow metal is no longer a means of payment. Before money can be set aside, it must first be put into circulation … by a loan. The Scrooge of old could hoard his gold with no debt required in return but he could not do likewise today: if no one borrowed, deposits could not accumulate in banks and there could be no piles of notes in the coffers either. For one person to not spend all of his income, somebody else must always spend more, one way or another.

Credit gives us all a degree of freedom in adjusting expenditure to income. It allows people to manage their spending according to their intertemporal preferences: borrowers can pay for purchases before their income gives them the wherewithal to do so; lenders can put off spending a portion of their own. The constraints linking income and expenditure nevertheless remain, and handling them is precisely the purpose of today's financial systems, as we shall see later in this chapter. In developed economies, the extent to which individuals borrow directly from one another has been greatly reduced. Companies do of course lend money to one another, largely in the shape of trade credit. For the most part, however, loans are now arranged through intermediaries: today's debt most often stems from loans granted by financial institutions or from the issuance of securities on organised markets. The

assets that are their counterpart are then held as a liability of those financial institutions or in the form of securities. This intermediation has helped accelerate economic development by making it easier to finance both investment and consumption.

The specific features and architecture of financial systems may differ from one country to the next, but their microeconomic functions are always the same: they ensure the information-gathering and decision-making needed to provide credit while at the same time offering those who do not wish to spend all their income a menu of options to suit their investment horizon and their risk aversion.

To clarify the central role played by financial systems in shaping debt, this chapter begins by picturing an economy devoid of any such system. The resulting restrictions on lending transactions are striking. In such an environment, individual lenders and borrowers face an array of hurdles, even if both are keen to reach an agreement. This is precisely where financial systems can help, by removing those obstacles. Alongside the markets on which debt securities (and equities) can be issued, purchased and traded, there is a multitude of institutions that, taken together, grant loans and gather the savings of households and companies. There are varying degrees of interaction between these markets and institutions. Over time, channels of financing take form and evolve, which – by providing loans to different sectors of the economy and different types of borrowers – shape the resulting accumulation of debt.

1.1 From direct to intermediated lending

Picture a basic credit transaction in a world without any financial system. A small businessman, '*A*', nearing the end of his working life plans to lend money to '*B*', who is younger and needs the money to set up her own company. *A* might lend €100,000 for seven years, with *B* promising to pay back a lump sum of €120,000 on the due date. This option to pay back the entire amount with interest when the loan matures rather than in regular instalments suits *B*. She can grow her business without adversely affecting her expenses: based on her expected revenue growth and given the reasonable rate asked by *A*, she will set aside the funds needed to meet the final payment. This is a fairly straightforward transaction. Even so, as we shall see, a considerable number of conditions must be met to enable this type of deal.

First, as with a basic barter, the needs of the two parties must effectively coincide: *A* must be willing to tie up the €100,000 that *B* wishes

to borrow for seven years. This coincidence of wants is similar to that involved in the conventional barter of goods, except that, in this case, we are dealing with an 'intertemporal barter': €100,000 today in exchange for €120,000 seven years from now. In the absence of any financial system, this sort of direct lending is the only available option: credit transactions are limited to those in which the needs of both parties coincide. This restriction would of course be eased somewhat by allowing *A* or *B* to break up the planned transaction: if *A* cannot lend the full €100,000 needed by *B*, then *B* could come to an arrangement with other lenders; alternatively, if *B* does not need the whole €100,000 that *A* is seeking to invest, then *A* could find other borrowers. Breaking up transactions like this does, however, force the relevant party to incur additional costs caused by multiple transactions and the search for solutions – a search that will be all the more laborious because the coincidence of wants in each case applies not only to the loan amount but also to its maturity.

Lending risks

This initial hurdle is far from being the only hindrance to direct lending: *A* may, for instance, be willing to tie up the exact sum needed by *B* for seven years, but he may still be reluctant to lend her the money since the arrangement is not without its risks from his standpoint, chief among which is the chance the loan may not be paid back when it matures. To take on this risk, *A* must have faith in *B*'s ability to keep her end of the bargain; he must also trust in her willingness to do so or believe in his ability to compel her to do so if push comes to shove! This *credit risk* is not the only factor at play. By tying up the loaned amount for seven years, *A* also runs the risk of needing the money in the interim. He naturally believes this will not be the case, but he cannot be sure. If, in the twilight of his career, business is bad and revenues dry up, he cannot simply demand that *B* repay the outstanding amount before the due date. He will of course count the sum owed among his assets … but he may lack the liquidity needed to cover his day-to-day expenses. By lending the money for seven years, he therefore also takes on a *liquidity risk*, meaning he may, during the term of the loan, find himself having to borrow at an unfavourable rate or rein in his spending.

Now, imagine that, to reduce this risk, *A* suggests to *B* that they break up the loan – not with respect to its amount, but with respect to its length: *A* will lend the money over a period of three years rather than seven, and will naturally grant a lower interest rate. The reasoning here is simple: three years from now, *A* will have a better idea of how *B*'s business is growing, as well as a clearer picture of her ability to pay back the loan. He

will thus gain more insight to assess the risks involved in lending for another four years. He will also know where he stands with respect to his own funds. In short, he will be better placed to gauge his credit risk and his liquidity risk.

Still, while short-term loans reduce risks for the lender, the same is not true for the borrower. What happens if, three years down the road, *A* decides not to roll over the loan for some reason? *B* will have to pay it back no doubt before she has had time to fully amass the revenues expected at the outset. If she lacks the necessary liquidity and no one else is willing to lend her the money, she may be forced – to honour her debt – to sell off part of the assets she has acquired, at a loss. Shortening the duration of the loan therefore passes on the liquidity risk to the borrower. And that is not all. What if financial conditions suddenly tighten in three years? The interest rate for a four-year loan will then be much higher than the rate which, combined with the loan granted three years earlier, would have led to the seven-year rate of the initial arrangement. The total cost of the loan will be significantly higher as a result. Consequently, shortening the duration of the loan also forces the borrower to take on an *interest-rate risk*. By agreeing to lend the money for seven years at a fixed rate from the outset, the lender could unburden the borrower of this risk (but he might regret doing so three years later if interest rates do indeed go up!).

The inhibiting effect of risk aversion

By limiting the loan duration to offset his own risk, the lender transfers more risk to the borrower: in this case, *B*'s reliance on her company's revenues – her *business risk* – is compounded by an interest-rate risk and a liquidity risk. If *B* is relatively risk averse, she may well prefer the long-term option – a seven-year loan at a fixed rate – to the short-term arrangement, which is less risky for the lender. But, if the lender is also relatively risk averse, he may decide the second option is the only one to which he is willing to commit. As a result, prudence on the part of both lender and borrower will nip the deal in the bud. Taken to its logical conclusion, this example illustrates how credit transactions simply cannot occur in a world with no financial system if those who are looking to save and those who are looking to borrow are completely averse to financial risks. In this sense, by serving as an intermediary between lenders and borrowers, financial systems have progressively unburdened both sides of at least some of the risks they were unwilling to take on, while also circumventing the constraint of coinciding wants. In so doing, they have paved the way for the outstanding boom in credit – and resulting debt – seen in today's economies.

1.2 Loan providers and savings collectors

Financial systems sit midway between lenders and borrowers, gathering unspent income from one side and providing credit to the other. They take on or reduce the risks that would otherwise hamper the ability of households, companies and governments to transfer purchasing power from the present to the future. In a modern economy, these financial systems rest on three pillars: *banks* provide loans at the same time as they issue money; *markets* allow some companies to directly issue bonds and equities (Box 1); these securities are then largely bought by *institutions* that collect long-term household savings.

Box 1. Equity financing as an alternative to borrowing?

For an individual, lending is not the only way to transfer purchasing power over time. Someone who does not spend all of his income can, for example, use what he saves to buy commodities and a machine to manufacture goods (or provide services) he can then sell. By investing today, he becomes the owner of a business whose production will give him a source of revenue. This method of transferring purchasing power from present to future is in fact the only option available in a closed economy to its agents taken as a whole: since they cannot lend to the rest of the world, they can only invest the unused portion of their income in their own economy in things like equipment, real estate and research. For individuals, however, this approach is not without its dangers: by committing their savings in this way, they run the risk of losing their money … and leaving themselves with no income in the future since there is no guarantee their products or services will be sold at the expected price, if they are sold at all.

On the scale of an economy, however, this business risk is shared between all parties involved in market production: employees risk earning less or even losing their jobs if things go badly, lenders may not be repaid the money they are owed, and business owners might lose all or part of the capital they chose to tie up. The legal and financial organisation of an economy is designed to limit and allocate these risks so that those related to the operation and expansion of its production capacities can be borne. The creation of joint-stock companies, in particular, provided a means of sharing the capital companies need in order to grow. Shareholders acquire part ownership of the company by giving it the equity it needs, which the business can then risk losing. In return, its shareholders receive a portion of any future profits. For companies, the issuance of shares (aka equity financing) and, more broadly, the injection of capital by their owners is

nonetheless a prerequisite – not an alternative – to borrowing: nobody will lend to companies that have no funds of their own.

For those willing to accept the risks involved, acquiring property rights – through ownership of an individual company or part ownership of a joint-stock company – offers an alternative to buying debt. This type of acquisition can enable the transfer of purchasing power over time (like a loan), through entitlement to dividends and possibly the selling of property rights. For all that, such investments provide uncertain returns and are inherently illiquid: owners can only recover the capital they invested – along with any capital gain – by selling them. The existence of markets on which the shares of listed companies can at any time be sold reduces the liquidity risk involved in holding such securities. Yet this does not reduce the risk of capital loss. Finally, it should be noted that transactions involving shares that have already been issued – as well as those involving shares in unlisted companies – simply shift the related risks and hopes of making a profit from the seller to the buyer: they do not provide funds to the company that issued them.

The central role of the banking system

Banks play a crucial role in the financial system. Not only do they provide loans, but they also issue the money that circulates in the economy. These two activities are closely linked. Credit money supplanted coin – gold and silver – a long time ago. When banks grant a loan, they credit the relevant amount to the recipient's account. The recipient can use that deposit to cover his expenditure. The deposit will then mix with other deposits and flow from one bank account to another as payments are made … and will only disappear when loans are repaid (Box 2). As a result, banks are constantly lending purchasing power that will be 'saved': money, whether coin or credit, represents purchasing power that circulates each time it is used to make a payment; but it cannot be 'spent' in so far as it is always held by someone. However, there is a key difference between coin and credit money: the former is nobody's debt whereas the latter is a bank's debt, issued each time a bank grants a loan. Taken together, banks therefore have a lending capacity that is not limited by their resources, as they are the ones that create those resources in the first place: as long as a loan remains an asset of the banking system, the counterpart deposit will remain part of its liabilities, one way or another.

Still, several factors limit how much credit each bank can grant. When they lend money, banks take on all or part of the aforementioned risks. And when they take on risks, there is a chance they will suffer losses: the lending capacity of banks is not limited by their resources; it is limited by

the losses they can absorb. That limit depends on the capital they have available to offset those losses – their equity capital – and on the prudential rules they impose on themselves or that are imposed on them by their oversight bodies and, in particular, by their central bank, the public institution that forms the cornerstone of the banking system.

The clearest risk to banks is credit risk. Yet it is the business of banks to take on that risk: a significant chunk of their business lies in ensuring they have the means to gauge and prevent credit risks. To that end, they draw on the data they process as a matter of course, such as a borrower's financial history, accounts held at the bank, sources of income, reasons for borrowing, repayment plan, guarantees and so on. Banks use all of this information to determine the creditworthiness of applicants and their projects. Yet banks base their lending decisions on more than this assessment alone. Credit risk is not the only threat they face. To take into account the borrower's risk aversion, banks also need to unburden the borrower of the inherent liquidity risk by lending over a period long enough to ensure the borrower can accumulate sufficient income to repay the loan. Like the small businessman we saw earlier in this chapter, banks will then take on a liquidity risk that they will endeavour to evaluate.

It may seem surprising to suggest that banks are exposed to liquidity risks given that, as we have emphasised, they create the very funds they lend. The deposits generated as a counterpart to the loans that are on the asset side of a bank's balance sheet remain on the liability side of the banking system's balance sheet but may not necessarily remain a liability of the bank that granted the loans. The banking system consists indeed of a large number of banks, and deposits flow daily between them. These deposits are also freely exchangeable for banknotes issued by the central bank. Therefore, each bank must ask itself – whenever it grants a new loan – whether it will have sufficient funds tomorrow to cover all the loans on the asset side of its balance sheet. If, one day in the future, its deposits fall short of this amount, it will need to borrow from other banks via the interbank market[1] or directly from the central bank, at a potentially unfavourable rate. To manage this liquidity risk, all banks must strive to anticipate the evolution of their cash position. They do this daily by comparing the tenor of outstanding loans on their books with expected changes in deposits, which involves analysing clients' account activity. To

[1] In this market, banks lend their surplus liquidity to those that lack liquidity on a daily basis.

gain further insight, banks might also offer clients the opportunity to put any money they do not plan to spend in the near future in long-term savings accounts, which usually offer better rates than current accounts.

Box 2. Birth, life and death of a bank deposit

Here, we provide a rudimentary overview of how credit money is issued, how it circulates and how it eventually turns into banknotes … or disappears.

a) Bank Y grants a €500 loan to Ms Smith, one of its customers **(1)**. The relevant amount is credited to her account. Ms Smith uses the money to pay a debt she owes to Mr Jones, who has an account at the same bank: Bank Y will then debit Ms Smith's account and credit €500 to Mr Jones' account **(2)**.

Balance sheet of Bank Y

Assets		Liabilities		
Loan to Ms Smith	+500	Ms Smith's deposit	+500	**(1)** Bank Y grants a loan to Ms Smith
			-500	**(2)** Ms Smith pays Mr Jones
		Mr Jones' deposit	+500	
Total	+500	Total	+500	

b) Now let us assume Mr Jones needs €500 in banknotes. His bank will turn to the central bank, which has a monopoly on issuing banknotes. Each commercial bank holds an account with the central bank which it uses to pay other banks or obtain banknotes. Bank holdings at the central bank – their reserves – and banknotes constitute 'central bank money', but only banknotes circulate in the economy: reserves are used solely for interbank payments. By drawing on its reserves to obtain banknotes, Bank Y exchanges one type of central bank money (its reserves) for another (banknotes). It then delivers these banknotes to its customer and debits his account **(1)**. The customer has thereby exchanged the deposit he received for cash. If, however, Bank Y does not want its reserves to dwindle, it can ask the central bank to 'refinance' the loan it has given to Ms Smith **(2)**: in return, it will provide the loan as collateral and pay interest to the central bank at a set rate. This will bring Bank Y's reserve account back to its initial level but will in normal times increase its cost of funds.

	Balance sheet of Bank Y				Balance sheet of the Central Bank				Consolidated balance sheet of the banking system			
	Assets		Liabilities		Assets		Liabilities		Assets		Liabilities	
	Loan to Ms Smith	+500					Banknotes in circulation	+500	Loan to Ms Smith	+500	Banknotes in circulation	+500
			Mr Jones' deposit	+500								
(1)	Reserves	-500		-500			Reserves of Bank Y	-500				
(2)		+500	Loan from the CB	+500	Loan to Bank Y	+500		+500				
	Total	+500	Total	+500	Total	+500	Total	+500	Total	+500	Total	+500

(1) Banknotes are provided to Mr Jones.

(2) Bank Y's reserves are rebuilt.

c) If Mr Jones does not have an account at Bank Y, the transaction described in paragraph a) will unfold differently. Bank Y will see Ms Smith's deposit leave its books … to be credited to Mr Jones' account at Bank Z **(1)**. Bank Y will thus pay €500 to Bank Z using its reserves at the central bank. Bank Y's central bank reserves will drop by €500 and Bank Z's reserves will increase by the same amount **(2)**.

	Balance sheet of Bank Y				Balance sheet of the Central Bank				Balance sheet of Bank Z			
	Assets		Liabilities		Assets		Liabilities		Assets		Liabilities	
(1)	Loan to Ms Smith	+500	Ms Smith's deposit	+500 -500							Mr Jones' deposit	+500
(2)	Reserves	-500					Reserves of Bank Y	-500				
							Reserves of Bank Z	+500	Reserves	+500		
	Total	0	Total	0	Total	0	Total	0	Total	+500	Total	+500

(1) Ms Smith's deposit leaves Bank Y and goes to Bank Z.

(2) The central bank debits Bank Y's account and credits Bank Z's account.

Bank Y may want to immediately rebuild its reserves (commercial banks must avoid being overdrawn at the central bank). If Bank Z feels it has too much in its reserve account, the two banks may then agree on a loan with an interest rate that is usually slightly higher than the one paid by the central bank on its reserves **(1)**. Here, once again, the loan will involve a change to the central bank's books: Bank Y will have €500 credited to its account and Bank Z's account will be debited by the same amount **(2)**. Following this transaction, both banks' reserves at the central bank will return to their initial levels (although the amount borrowed by Bank Y will make its cost of funds a little higher than in scenario a).

	Balance sheet of Bank Y				Balance sheet of the Central Bank				Balance sheet of Bank Z			
	Assets		Liabilities		Assets		Liabilities		Assets		Liabilities	
(1)	Loan to Ms Smith	+500	Loan from Bank Z	+500							Mr Jones' deposit	+500
	Reserves	-500					Reserves of Bank Y	-500	Loan to bank Y	+500		
(2)		+500						+500				
							Reserves of Bank Z	+500	Reserves	+500		
(2)								-500		-500		
	Total	+500	Total	+500	Total	0	Total	0	Total	+500	Total	+500

(1) Bank Y borrows from Bank Z.

(2) The central bank credits Bank Y's account and debits Bank Z's account.

d) There is one more possible destination for the deposit created by Bank Y and received as payment by Mr Jones (who still has an account at Bank Z). Let us now assume his bank granted him a €500 overdraft a few weeks earlier. The payment from Ms Smith will serve to settle that debt. The loan to Mr Jones will be removed from Bank Z's assets at the same time as the €500 deposit is removed from its liabilities **(1)**. The €500 deposit created by the €500 loan to Ms Smith from Bank Y will thus be removed from circulation.

	Balance sheet of Bank Y				Balance sheet of Bank Z				Consolidated balance sheet of the banking system			
	Assets		Liabilities		Assets		Liabilities		Assets		Liabilities	
	Loan to Ms Smith	+500							Loan to Ms Smith	+500		
			Loan from Bank Z	+500	Loan to Bank Y	+500						
							Mr Jones' deposit	+500			Mr Jones' deposit	+500
(1)					Overdraft	-500		-500	Overdraft	-500		-500
	Total	+500	Total	+500	Total	0	Total	0	Total	0	Total	0

(1) By paying off his overdraft, Mr Jones cancels out the deposit created by the loan to Ms Smith.

Yet, if to further adapt to the borrower's risk aversion, the bank opts to grant a relatively long-term loan that also offers a fixed rate of interest, it takes on an interest-rate risk as well. At least some of the resources that form banks' liabilities carry an interest rate that will fluctuate according to economic conditions. By granting a fixed rate for the entire duration of the loan, the bank risks at times having to pay out a higher-than-expected rate of interest for the resources used to finance the loan. If this situation lasts a long time or happens often, the bank will risk losing money rather than earning it. To pre-empt this kind of problem, it will draw on data concerning the likely level of interest rates over the coming years. The bank

will rely on its memory of past interest rates and its assessment of the economic outlook. Based on this information, it will determine what level of interest it should offer the borrower.

Bond markets and savings collectors

Banks are a crucial pillar of the financial system and have a unique ability, by creating money, to make loans that anticipate future savings. Bond markets may appear to play a more modest role, seemingly just a place where lenders and borrowers interact. However, this direct interplay unfolds in conditions that are very different from those seen at the start of this chapter. To begin with, only certain borrowers – large companies, governments and supranational organisations – can borrow on these markets by issuing bonds. It must indeed be possible to assess the credit risk of such securities based on public information. The bonds issued can also be traded: anyone purchasing a bond at issuance is free to sell it at any time at the market price. These markets are organised exchanges that – despite their 'passive' role – help remove some of the restrictions that fetter the development of direct loans. First, they make it possible to borrow from a number of different lenders: borrowers issue securities for the amount they wish to raise and individual lenders choose how many securities they wish to purchase, which in turn determines how much they lend. Second, bond markets allow lenders to manage the credit, interest-rate and liquidity risks they take on, since they can at any time avert or at least limit their losses by selling all or part of the securities they have purchased.

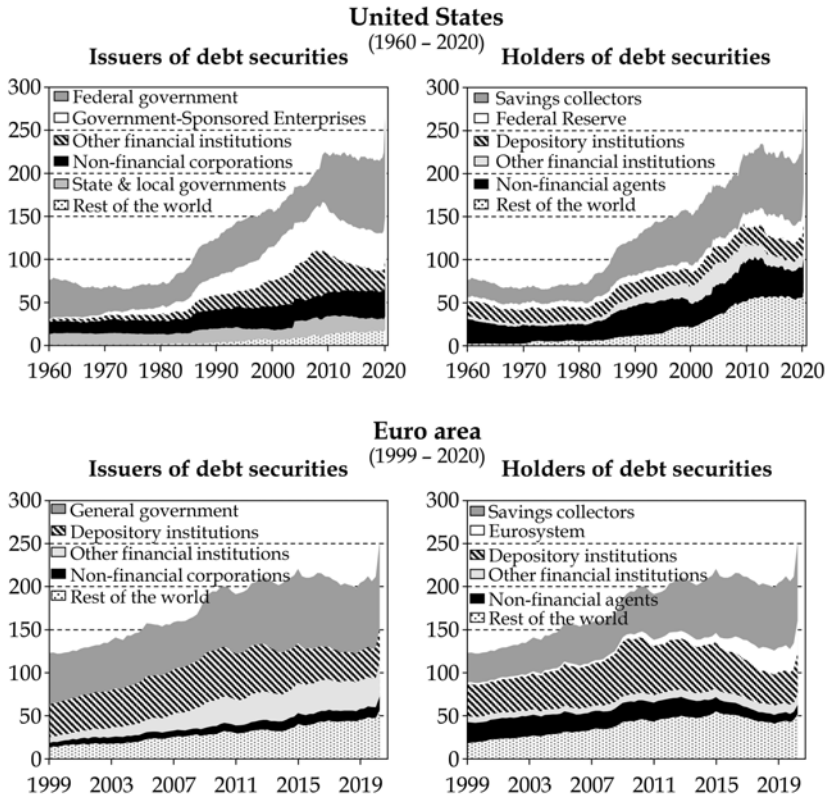
Moreover, bond markets not only facilitate direct borrowing by a few large borrowers, they also provide a source of funding for financial institutions involved in granting smaller loans. In many countries, non-bank intermediaries that specialise in providing consumer loans, for instance, obtain funds by issuing bonds: they engage in 'wholesale' borrowing to offer 'retail' loans. Banks also issue bonds to reduce their liquidity and interest-rate risks. At the same time, other institutions involved in retail lending – specialised intermediaries or banks – can sell loans that will be pooled and repackaged as negotiable securities that become an instrument of wholesale borrowing – a process known as securitisation. A common practice in the United States since the early 1970s, the securitisation of mortgages was central to the financial crisis that erupted in the summer of 2007.

Bond markets play an important role in the United States, where they provide a natural outlet for the third pillar of the financial system: savings collectors, particularly those involved in collecting long-term savings (Box 3). Like banks, these intermediaries gather unspent income, but unlike banks, they do not grant loans. They also differ in that they collect income, mainly from households that want to transfer purchasing power over a relatively long time horizon. This is notably the case with pension funds, which play a prominent part in the US system (as well as in a few European countries such as the Netherlands) and life insurance companies, which play an important role in many European countries and in Japan. By their very nature, these institutions provide the financial system with not only a source of financing but also a source of information on the duration of the savings collected. Based on the demographic makeup of its members, a pension fund can in fact estimate the net outflows it will face in the coming years. The same goes for life insurance companies: in opting to invest their savings in a policy that offers the prospect of a long-term return rather than simply depositing their money in a bank, clients also give life insurers information about when they plan to spend those savings.

Box 3. Bond markets in the United States and the eurozone

The bond market has many players. It provides a source of financing for governments, local authorities and companies (private and public), as well as issuers of securitised loans. The bonds issued can be held by all kinds of financial or non-financial agents, such as private individuals, companies, commercial banks, central banks, pension funds and life insurers. The US market is the world's largest by far. In 2019, its stock of debt securities amounted to over $47trn. In this market, savings collectors (life insurance companies, pension funds and mutual funds) are now by far the biggest domestic players (Figure 1). Their holding as a percentage of GDP had risen fourfold since the early 1980s. In the euro area, the stock of debt securities amounted to over $26trn in 2019. As in the United States, savings collectors are the main holders of securities, but banks hold a larger share than in the United States, while the share of private non-financial agents (households and companies) is much smaller. As a percentage of GDP, however, the amount of debt securities held by the rest of the world is relatively similar on both sides of the Atlantic.

Figure 1. Bond issuers and holders (% of GDP)



Sources: Federal Reserve, European Central Bank.

These institutions strive to increase the value of collected savings to boost or at least preserve their purchasing power, considering the relatively long investment horizon of the savers. As a result, they buy assets which – alongside a regular source of income – can be expected to generate capital gains, such as real estate and equities. Real estate is, however, a relatively illiquid asset (since buildings cannot be sold from one day to the next on an organised market). As for shares in listed companies, they are fairly liquid but are subject to sharp fluctuations in prices. What is more, the supply of these two types of assets is relatively inelastic: when demand increases, their price quickly rises. As a result, debt securities represent another key outlet for those who collect long-term savings. The same goes for investments made on behalf of third parties by asset managers, who offer clients an opportunity to invest their savings by acquiring a share of the

funds they manage. These funds are usually invested in securities – especially in debt instruments – to make, at least to some extent, the risks taken on behalf of their clients manageable and preserve the liquidity of their investments.

1.3 Risk-takers and financing channels

The architecture of financial systems in advanced economies is no longer limited to the three pillars we have just outlined. The financial liberalisation that began in the 1970s led to the emergence of new markets and new players, whose business is not to issue loans: instead, they shift and shoulder all or part of the risks associated with these loans. These risk-takers have boosted the lending capacity of the financial system, as they can unburden conventional institutions of some of the risks they take. They can also contribute to the creation of alternative channels of financing, which, like banks, are capable of funnelling available savings towards one kind of borrower or another. These channels – known as shadow banking – are flexible but also fragile: the business of the risk-takers that enable them is by its very nature vulnerable to changing attitudes to risk.

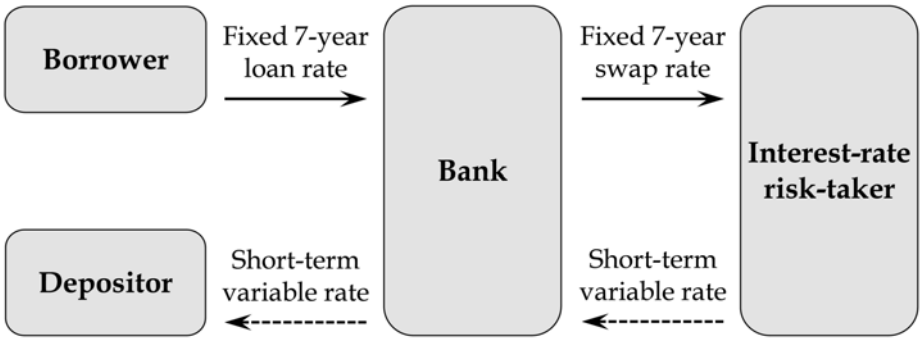
Derivatives and risk transfers

Derivatives markets can be used to transfer risks from one party to another. A credit default swap can, for instance, enable a lender – such as a bank or bond market investor – to hedge against the risk of default by a borrower (and thereby offload the credit risk of a loan) by regularly paying a premium that will remain fixed for the duration of the insurance contract. In exchange for this premium (hence the name 'swap'), the counterparty will compensate the lender for any losses suffered if the borrower defaults.

Of all the derivatives markets, though, the interest-rate swap market is by far the most developed. It can enable lenders to offload the risk related to a change in the cost of funding. For example, a bank that has granted a loan at a fixed rate for seven years may want to offload the risk linked to the fact that the cost of its funds will vary over those seven years in line with interbank rates. A swap contract will enable the bank to receive, for the entire duration of the loan, interest calculated at a rate that will track interbank rates. In exchange, the bank simply agrees to pay interest that is set at a fixed rate at the time of arranging the swap. The bank will thus secure a set net interest margin over the seven-year period (the difference between the fixed rate for the loan it has granted and the fixed rate it will pay for the swap). Meanwhile, its counterparty will take on

the risk of making a stream of payments the amount of which will vary according to future changes in the interbank rate, receiving in exchange a fixed stream of payments over seven years (Figure 2).

Figure 2. A bank unloads its interest-rate risk via a swap



Note: Arrows indicate interest payments based on the loan amount at the specified rate.

In the above diagram, a borrower obtains a seven-year loan from a bank. During this time, he will pay interest on the loan, which is set at a fixed rate. To finance the loan, the bank uses deposits that carry an average interest rate that will vary over the seven years in line with the interbank rate (the variable short-term rate shown in the diagram). To hedge against the risks related to this variable rate, it arranges an interest-rate swap with another party, the 'interest-rate risk-taker'. The swap ensures the bank receives a stream of payments pegged to the interbank rate. The transaction gives the bank an overall margin equal to the difference between the fixed-rate interest received on the loan and the fixed rate paid on the swap.

Source: Authors.

The use of derivatives to take on or hedge against risks is now common practice in the financial system. Interest-rate swaps are negotiated daily. The fixed rates that form in this market – those to be paid in return for a variable interest rate – now serve as a benchmark for banks in determining the rates at which they grant loans. As for credit derivatives, these are only available to issuers whose credit risk can be assessed on the basis of public information.

Derivatives markets are not the only way to hedge against financial risks. In many developed countries, specialised institutions assess and insure credit risk – on payment of a premium – for all sizes of loans granted to private individuals and businesses. In the United States, the bulk of the home loans used to create mortgage-backed securities are insured by federal agencies. German banks meanwhile retain the credit risk of their fixed-rate mortgages (as well as that of the loans they grant to

local authorities) but unload the interest-rate risk. They do so by issuing covered bonds – also at a fixed rate – with the same maturity as that of the loan portfolio for which they wish to fix their funding cost. The underlying loans stay on their balance sheet and are used to back the issued bonds, which are known as *Pfandbriefe*. The cost of funds required to finance these loans until they reach maturity is thus set in stone, along with their net interest margin, i.e. the difference between the incoming fixed interest payments that banks receive from the loans on the asset side of their balance sheet and their outgoing payments – also fixed – for the bonds they have issued.

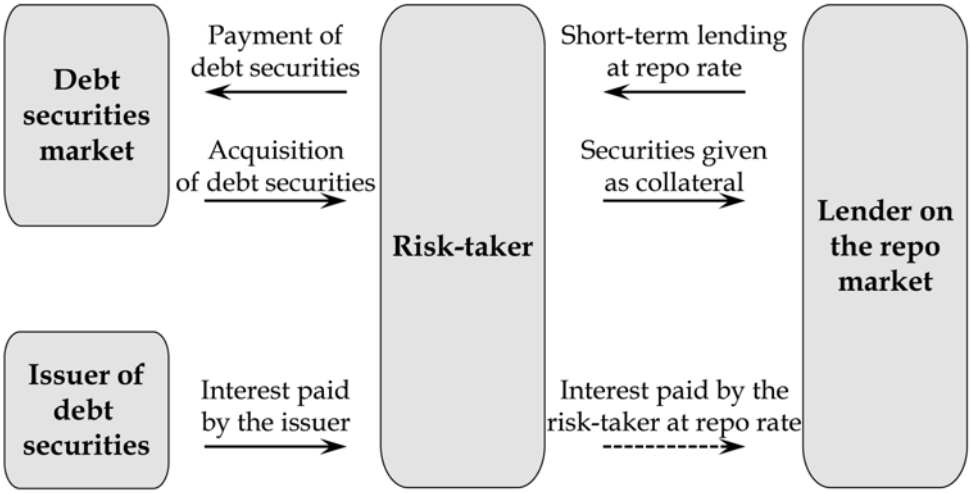
This ability to transfer risks lets the unburdened parties focus on other aspects of the lending business. Still, those who do take on these risks have a vested interest in honing their ability to assess them. This specialisation of operators enables further division of labour within the financial system, which, at least in principle, increases their ability to weigh the risks involved in loan transactions and possibly neutralise some of them. In relieving credit providers of at least some of the risks inherent to their lending, this division of labour also reduces their capital requirements. If the parties who assume these risks are subject to – or impose on themselves – less stringent prudential rules, the capacity of the financial system to grant credit will be further increased … but so will its vulnerability!

The repo market: a key link in shadow banking

Growth in the repurchase agreement – or repo – market has further reinforced the ability of non-bank financial institutions to take risks traditionally borne by banks. The repo market makes it possible to borrow for a very short period – over a day, week or month – using securities as collateral, notably debt securities. Borrowers retain ownership of the securities pledged as collateral and continue to receive income from them (Figure 3). Lenders (the cash providers) include money market funds that collect purchasing power from households and businesses that wish to set aside money without taking any risks – not even those associated with a bank deposit (given that the amount covered by deposit insurance is limited). Banks, insurers and the treasurers of big companies can also lend through the repo market if they wish to protect a portion of their liquidities against risks: since repo transactions are very near-term arrangements,

backed by securities whose value must always be greater than the amount loaned,[2] there is, in principle, no risk to the lender.

Figure 3. Repo transactions, a key link in shadow banking



Note: In this diagram, a risk-taker has negotiated (via a financial intermediary) to buy securities and finance the acquisition through a repo agreement. Following this transaction, he will own the securities and will take on the associated risks, receiving the interest on those securities in return. He will also pay repo market lenders compensation that may vary each time the repo is rolled over.

Source: Authors.

Repo market borrowers meanwhile are looking to acquire securities but lack the capital needed to finance the purchase of these securities in full. A repo agreement lets them borrow the extra capital they need. Since these loans are short term, borrowers will need to roll over the repo as long as they hold the securities, meaning they will regularly reimburse their lenders … by arranging a new repurchase agreement. Broker-dealers' business as 'market makers', for example, requires ongoing use of such arrangements. To maintain the liquidity of the securities market in which they operate, such as corporate bonds, government securities or securitised loans, they must constantly be in a position to act as a counterparty to those who wish to buy and sell those securities, which means they need to hold

[2] This safety margin is known as a 'haircut': the more the price of the securities given as collateral is liable to vary, the bigger the haircut.

sufficient stock of them. To finance that stock, they continually borrow on the repo market, using the securities they hold as collateral.

These repo transactions are a vital part of shadow banking operations. In this lending channel, which operates alongside the conventional banking system, risk-takers will acquire debt securities and take on the same types of risks as those taken by banks. But unlike banks, these risk-takers – chief among which are hedge funds – cannot issue money. And, unlike savings collectors, they use the capital they raise from investors as 'equity' to absorb any losses. To pay an attractive return to those who give them capital, these risk-takers borrow to buy bonds (or securitised loans). They finance their purchases by borrowing on the repo market, using these securities as collateral. They take the same risks as banks: a credit risk (if the securities purchased are defaulted on or depreciate, they will lose money) and an interest-rate risk (they receive the fixed rate of interest on the securities they provide as collateral and pay a rate of interest that can vary from one repo transaction to the next). Most importantly, they face a liquidity risk: if the parties that lend them money fear the assets they have been given as collateral are likely to depreciate, they will simply stop lending. If that happens, these risk-takers will be left with little choice: find other lenders or sell the purchased securities, potentially at a loss, to repay their loan.

The repo market enables non-bank actors that hold such securities to finance them constantly using saved purchasing power. However, this purchasing power is not their own: they must borrow it by continually pledging their securities as collateral in repo agreements. *Savings invested 'risk free' thus bankroll actors that take on the risks associated with the debt securities they have acquired without first setting money aside*. For shadow banking operators, this repo market plays a role analogous to that of the interbank market for commercial banks. Its development, along with growth in securitisation, has helped increase the plasticity of the financial system. In the United States in particular, these changes facilitated the creation of financing channels able to funnel a massive amount of savings – even from elsewhere in the world – into a very specific type of debt instrument: mortgage-backed securities. The amounts involved were all the higher because the credit risk associated with some of these loans was covered by government-sponsored enterprises. That left the risk-takers that bought these securitised loans with the interest-rate risk … and the liquidity risk. Yet as soon as doubts over the value of these securities began

to arise, repo market lenders erred on the side of caution, and risk-takers quickly found themselves forced to sell their securities at a loss, triggering what has since become known as the Great Financial Crisis (Brender and Pisani, 2010).

Financial systems by no means issue loans in the same way to all potential borrowers. The need to weigh and take on the risks related to these loans has forced financial institutions to specialise. Borrowers do not go to the same 'window' to finance the construction of a factory, a research facility or a car purchase. Potential savings are harnessed through the various windows that are in place. A financial system is thus much more than a mere 'loanable funds' market in which lenders and borrowers meet. Financing channels emerge that will, for a time at least, facilitate the indebtedness of some borrowers more than others. By determining how savings are allocated within an economy – or even on the scale of the global economy – these channels also determine the nature of debt arising therein.

2. THE MACROECONOMIC DIMENSION OF DEBT

The financial system forms an 'active' interface between lenders and borrowers. Its role goes beyond simply borrowing from some parties to lend to others, and it does more than just put them in contact with one another. Its organisation and the institutions that are the cogs in its wheel also help reduce the risks taken by lenders and borrowers to transfer purchasing power over time. The system thus makes it easier to mobilise savings while at the same time influencing how they are allocated. What is more, it maintains the accounting identity that is central to the workings of a market economy: ensuring that total expenditure is at all times equal to total income from market output, even if those who earned this income do not use it all to buy the goods and services produced. Still, left to its own devices, the financial system does not guarantee full employment[3] of productive resources. The balance between total expenditure and total income holds true *irrespective of the level of market output*. From this standpoint, whether the economy is or is not at full employment is immaterial.

Full-employment output is a conceptual benchmark that has no immediate bearing on the total amount of lending. However, *the actual level of output is a function of that amount*: if the total value of loans granted is too low, available productive capacity cannot be fully employed; if it is too high, expenditure will be such that the prices at which output is sold will be driven higher. This is where commercial banks play a vital role. Their ability to create money puts them in a position to inject sufficient credit to bring the economy to full employment … and even beyond. The central bank meanwhile wields the instruments of monetary policy in a bid to control the flow of credit: by influencing the general level of interest rates, it aims to ensure that the total amount loaned is neither too high nor too low in order to keep the economy as close as possible to full employment. Yet interest rates are far from being the only factor dictating the amount of

[3] Full employment is a somewhat vague concept that often gives rise to debate. Our goal here is not to provide a specific definition but to study how macroeconomic policy can bring the economy to a target level of activity corresponding to a satisfactory economic equilibrium, which we will hereinafter call 'full employment'.

income that private agents set aside. The extent to which interest rates can affect the spending that agents choose to bring forward by borrowing also has its limits. If low interest rates do not encourage private agents to borrow sufficiently to bring the economy to full employment, the intervention of a borrower of last resort – the government – will be needed to achieve this goal.

2.1 Debt and macroeconomic equilibrium

The seemingly trivial balance between total purchases and total sales, total income and total expenditure, is a formidable constraint when it comes to maintaining full employment. If some economic agents choose not to spend all of their income, then to achieve full employment others will need to borrow and spend more than their income (Koo, 2018). This premise sits at the heart of Keynesian analysis (Combemale, 2010), even though the conventional presentation in terms of savings and investment often masks underlying borrowing behaviour (Denizet, 1969).

One person's debt ... is another's savings

First, let us picture a closed economy comprising only households and businesses. Market output – or, to simplify, GDP – provides a source of income in the shape of wages for the former and profits for the latter. These wages can be paid and these profits pocketed because the output to which these agents have contributed has been sold … to households, in the form of goods and services for consumption, and to businesses, in the form of goods and services for investment (to simplify matters, we will assume that only businesses spend to invest). Now, let us assume that the consumption of households accounts for only part of their income at full employment, with the rest being saved. Let us also assume that businesses devote all of their profits to investment. For the economy to effectively achieve full employment, the aforementioned condition must be met: if households spend only part of their wages on consumption, then businesses must spend more than their profits alone on investment. Which means they must borrow the difference (to further simplify matters, we have omitted the possibility of equity financing). The amount borrowed must be equal to the amount households choose to save at full employment (Box 4).

Box 4. Propensity to spend income and borrowing: a simplified framework

First, let us consider a closed economy comprising two agents, Agent 1 and Agent 2, whose income at full employment is $\overline{Y_1}$and $\overline{Y_2}$, respectively. The equation representing full-employment income in this economy is:

$$\overline{Y} = \overline{Y_1} + \overline{Y_2}$$

Agent 1's share of this income is α and that of Agent 2 is (1- α). This gives:

$$\overline{Y_1} = \alpha\overline{Y} \text{ and } \overline{Y_2} = (1-\alpha)\overline{Y}.$$

Let δ_1 and δ_2 represent the propensities of the two agents to spend their full-employment income to buy the goods and services produced. For each agent, this propensity is the ratio between expenditure (consumption or investment) and income. If we assume δ_1 is less than one (i.e. if Agent 1 wants to set aside part of her income), the economy cannot achieve full employment if δ_2 is not greater than one (i.e. if Agent 2 does not spend more than he earns).

With full-employment income in this economy $\overline{Y}$ equalling the total expenditure of our two agents ($\overline{D_1}$ and $\overline{D_2}$), then:

$$\overline{Y} = \overline{D_1} + \overline{D_2} = \delta_1\overline{Y}_1 + \delta_2\overline{Y}_2 = \delta_1\alpha\overline{Y} + \delta_2(1-\alpha)\overline{Y}.$$

Therefore:

$$\delta_2 = \frac{1-\delta_1\alpha}{1-\alpha} = 1 + \frac{\alpha}{1-\alpha}(1-\delta_1).$$

If δ_1 is less than one, then $\delta_2$must be greater than one. For the first agent to set aside a portion (1-δ_1) of her income ($\overline{Y}_1$), the second agent must spend more than he earns and consent to borrow a fraction $\frac{\alpha}{1-\alpha}(1-\delta_1)$ of his income ($\overline{Y}_2$). The amount borrowed, equal to the amount that Agent 1 does not wish to spend at full employment, $(1-\delta_1)\alpha\overline{Y}$, must be all the higher, the higher Agent 1's share of income α and the lower her propensity to spend δ_1.

Now let us look at another closed, but more concrete economy, in which we will replace Agents 1 and 2 with households (H) and businesses (B). Households receive wages, which they spend on consumption, and businesses achieve profits, which finance their investment spending. The split between wages and profits is taken as being fixed: households' share of total income is α and businesses' share is 1-α. As in the previous case, we will assume households wish to save a fraction $(1-\delta_H)$ of their full-employment income (with $\delta_H < 1$) and spend only $C = \delta_H\alpha\overline{Y}$. Let I represent business expenditure (investment). For this economy to achieve full employment, companies must spend more than they earn by taking on debt. Total income being equal to total expenditure, then:

$$\overline{Y} = \overline{C} + \overline{I} = \delta_H\alpha\overline{Y} + \delta_B(1-\alpha)\overline{Y}.$$

This gives us $\delta_B = 1 + \frac{\alpha}{1-\alpha}(1 - \delta_H)$. As in the previous case, to enable the economy to achieve full employment and households to save a fraction of their income $(1 - \delta_H)$, companies will need to borrow a fraction $\frac{\alpha}{1-\alpha}(1 - \delta_H)$ of their profits. Their borrowing, $(1 - \delta_H)\alpha\overline{Y}$, is equal to household savings at full employment. The higher the share of wages α relative to GDP and the lower the propensity of households to spend their income δ_H, the higher the borrowing.

The same reasoning applies to a global economy comprising two regions: if, at full employment, the agents of Region 1 have a propensity to spend their income that is less than one, the global economy cannot achieve full employment if the agents of Region 2 do not spend more than they earn when their economy is at full employment; the borrowing of Region 2 will have to be all the higher, the higher Region 1's share of global income at full employment α and the lower its propensity to spend δ_1.

That said, household spending decisions and corporate borrowing decisions are independent and their determinants are very different. Businesses borrow if they need to invest. They may want to invest to seize new opportunities or boost their production capacity, for example. Households meanwhile have their own reasons for setting money aside: they may wish to save as a precaution, to give themselves a cushion against life's surprises; they may want to save for a major purchase in the future; or they may plan to accumulate purchasing power they can use when they retire … As we have seen, the financial system imposes a constraint on these different behaviours: in the highly simplified economy used here as an example, household savings will always be equal to corporate borrowing. But how do these two variables adapt to one another and what is the resulting level of activity?

To answer this question, we must again look at the nature of our market economy: people cannot make purchases if they do not have the purchasing power needed to pay for them. The direct-lending example we saw in the previous chapter linked one person's savings to another's borrowing via a single transaction: saver and borrower together decided on a transfer of purchasing power between them. This sort of 'direct' lending is less prevalent today but the growth of bond markets now provides an alternative in the form of transactions which – from our current standpoint – play an equivalent role: saved purchasing power is transferred directly to the issuer of a debt security, who can then spend it. Whether or not this transaction involves direct interaction between investor and borrower or whether it goes through an intermediary like the savings collectors seen in

the previous chapter is of little importance: the savings invested and the amount borrowed stem from one and the same transaction. Its amount is determined by market equilibrium, with market prices serving to adjust the supply of savings to the demand for borrowing: an abundant supply of savings will push up bond prices (and bring down yields), attracting borrowers, while high demand for borrowing will push up yields and attract savers. This mechanism is similar to the one used in the theory of 'loanable funds', in which the level of interest rates is determined by demand for and supply of loanable funds (Mankiw, 2008).

Two problems arise, nonetheless. Given that these transactions require savers to take risks, they can only represent a portion of their financial investment. Still, let us briefly ignore this particular impediment and imagine that such transactions could involve all savings available at full employment. By borrowing on the market the portion of income that households wish to set aside, businesses can enable output to effectively reach its full-employment level. Over and over, the income derived from the production of this output will be completely spent and will each time again go towards creating agents' income. *Yet the amount of this income and expenditure cannot grow*. Capital markets, whether for equities or bonds, enable the transfer of existing purchasing power from one agent to another but they cannot increase it. The value of market output will thus be destined to always remain the same and, unless prices continually fall, the volume of output will not be able to grow.

Bank loans and macroeconomic equilibrium

To unlock growth even when prices are 'downwardly rigid', or 'sticky', as is usually the case in our economies, additional purchasing power must constantly be created and used. Only banks can make this happen; as we have seen, they create the money they make available to borrowers. This money creation enables the value of market output to grow. In order for this growth to be effective, borrowers must actually borrow and loans must be granted. The attractiveness of those loans for borrowers will depend on the interest rates offered by banks. However, these rates are no longer determined by a market equilibrium that hinges on the availability of savings and demand for borrowing. They are dictated by the banks' own agenda: ensuring the best possible return on the capital provided by their shareholders. In the very rudimentary framework we have chosen as our example, the balance between savings and loans is struck in a very specific way: *the amount that businesses spend on investment, financed by borrowing, determines the amount of savings that households accumulate* (Box 4). If the amount of this borrowing is less than the amount households wish to save

at full employment, the economy will be unable to take advantage of any increase in its productive capacity. But if the amount of this borrowing is higher, then total expenditure on consumption and investment will push up the prices at which market output is sold, which will eat away at the excess purchasing power banks have created.

If banks grant loans in anticipation of future savings, there is still no reason why the amount of these loans must be precisely that needed to ensure full employment. First, as we have seen, their lending capacity is limited by the equity they have available and the prudential regulation by which they are bound. If this capacity is insufficient, their lending will also fall short: banks which, based on their prudential rules, do not have sufficient equity capital are a hindrance to economic growth. Yet even if this lending capacity is sufficient, there are still some possible shortcomings. Banks create the money they lend and, if unchecked, there is nothing to prevent them from lending an amount in excess of total full employment savings. Prices will of course drift upward but this will not impact their profits. Quite the contrary. As long as their cost of funds remains below the cost of the loans they have granted, banks' profit growth can remain in step with that of their loans outstanding. As long as the interest on deposits created is lower than the interest on loans granted, banks may be encouraged to ramp up credit, provided they can find willing borrowers. This is where 'central' banks come into play. They ensure commercial banks are not left to their own devices. Central banks not only impose prudential regulation; they also strive to use monetary policy to ensure the total value of the loans commercial banks grant keeps the economy as close as possible to what they consider to be full employment.

2.2 Monetary policy and interest rates

Unlike commercial banks, the central bank is a public body. In modern economies in which the issuance of money is no longer tied to gold reserves, it is the central bank's job to help maintain macroeconomic equilibrium by controlling the pace of lending. Even so, the central bank has no more insight than commercial banks as regards the amount needed to ensure this equilibrium: the household saving rate is a variable beyond the central bank's control and full employment is not an observable target. Still, when the economy strays too far from full employment, signs of strain do begin to appear. If the level of activity is too low, pressure from job seekers will curb wage increases and surplus capacity will rein in prices. In contrast, if the economy is above full employment, hiring difficulties will

push up wages and pressure on productive capacity will accelerate inflation. These signals serve as a guide to central banks in using the tools at their disposal to influence the issuance of loans. As we shall now see, those tools give them a means to control the interest rates on loans offered by commercial banks. By forcing the latter to make loans 'more expensive', a central bank can bridle lending; by allowing banks to offer 'cheaper' loans, it can aim to do the opposite. A central bank influences commercial banks' own cost of funding to affect the interest rates on the loans they offer (Borio, 2019).

Central bank money and interbank rates

As we have seen, the central bank is the banks' bank (Box 2). All commercial banks have an account at the central bank and the everyday transactions they conduct between them are settled via transfers from one account to another on the central bank's books. Since commercial banks must avoid being overdrawn, they take the precaution of keeping 'reserve' deposits at the central bank, assuming they are not – as is the case in the euro area – required to meet minimum reserve requirements. Each commercial bank obtains banknotes for its clients by debiting its account at the central bank. Yet, for the amount of banks' reserves and banknotes – which represent the central bank's liabilities – to increase as the economy grows, the central bank must increase the asset side of its balance sheet. It is the only institution able to create 'central bank money', which appears on the liability side of its balance sheet. Like a normal bank, it issues this particular money by granting loans. By increasing the amount of loans on the asset side of its balance sheet – through some form of lending – the central bank enables growth in commercial bank reserves and the amount of banknotes in circulation (Table 1). Demand for banknotes and the need for reserves thus leads to the replacement of a source of funds that banks generally receive at no cost (their clients' current-account deposits) with one they are ordinarily required to pay for (loans from their central bank). The profits of commercial banks therefore depend on the conditions in which the central bank provides them with its own money.

Central banks carry out transactions used to adjust the amount of reserves held by commercial banks on a regular basis, but nearly always for a very short period. When, as is the case with the European Central Bank, this injection of central bank money is done using the repo agreements discussed in the previous chapter, it is known as 'refinancing'. The amount of these liquidity injections is normally relatively low in relation to that of bank loans but the associated interest rates nonetheless have a significant impact on the interest rates offered by banks. For example, let us assume

the central bank decides to raise interest rates for the refinancing it offers the banking system in a bid to curb lending. Rates in the interbank market, in which commercial banks lend their surplus reserves, will then follow suit. In this market, banks that lack reserves will borrow from peers that have an excess: if the rate for refinancing from the central bank rises, banks that have surplus reserves will be in a position to lend at a higher rate and the interbank rate will also rise.

Table 1. Simplified Federal Reserve and European Central Bank balance sheets

Federal Reserve balance sheet, 6 January 2021 (US$, billions)

Assets		Liabilities	
Gold and foreign currency assets and claims	39	Banknotes in circulation	2,043
Lending operations and repurchase agreements	3	Reverse repurchase agreements	206
		Monetary institutions' deposits (banks' reserves)	3,164
Debt securities	6,741	Federal government's deposits	1,607
		Capital	39
Other assets	552	Other liabilities and revaluation accounts	275
Total	7,335	Total	7,335

ECB balance sheet, 1 January 2021 (€, billions)

Assets		Liabilities	
Gold and foreign currency assets and claims	907	Banknotes in circulation	1,435
Lending operations and repurchase agreements	1,793	Monetary institutions' deposits (banks' reserves)	3,489
Debt securities	3,891	Governments' deposits	516
		Capital	109
Other assets	388	Other liabilities and revaluation accounts	1,431
Total	6,979	Total	6,979

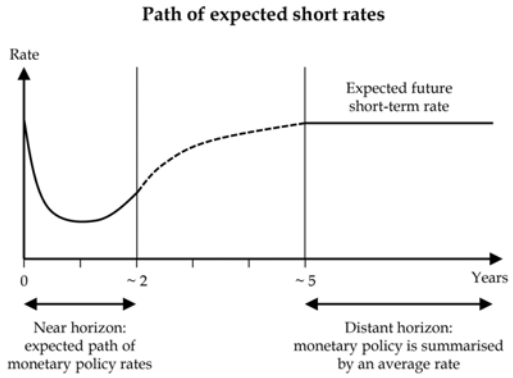
Sources: US Federal Reserve, European Central Bank.

From interbank rates to interest on bank loans

Now let us assume the central bank 'unexpectedly' raises its interest rate by, say, 50 basis points and that commercial banks on average expect the rate will remain at this higher level over the next three years. They will then expect interbank rates to also be around 50 basis points higher over the next three years. The interest rates on any loans of up to three years that they grant to their clients will climb as a result. Before lending at a fixed rate for a set period, banks will compare how much they can make on the loan with how much they could make by investing the same amount in the

interbank market over the same period. The latter investment entails virtually no risk, whereas the loan requires them to take on all of the aforementioned risks. The interest rate for the loan will therefore have to be equal to that obtained from an investment renewed daily in the interbank market plus a risk premium. If banks expect interbank market rates to be 50 basis points higher over the next three years, the interest rates on the loans they grant up to that term will increase by the same amount. This example illustrates an inescapable fact: a central bank's ability to affect the interest rates on commercial bank loans depends not only on its own benchmark interest rate but also on *how commercial banks expect interest rates to evolve until the loans they provide reach maturity* (Figure 4).

Figure 4. Long-term interest rates and expected short-term interest rates



Note: Long-term interest rates are linked to short-term rates by market expectations of future short-term rates (Roley and Sellon, 1995). The above diagram breaks the expected short-term rates into three parts. At a shorter time horizon of one or two years, the expected short-term rate reflects market expectations with regard to future monetary policy. Here, the downward curve shows that agents expect looser monetary policy. It would rise if the opposite were true. At a longer horizon of more than four or five years, the expected short-term rate is an average rate based on expected inflation and growth. It is worth noting that these expectations generally reflect the relatively long memory markets have of past inflation and growth. The middle section represents the 'link' between the shorter- and longer-term expectations. Interest rates for a given term are thus the geometric mean of the short-term rates expected until maturity, plus a 'term premium' (the extra return that lenders demand to hold a longer-term bond instead of investing in a series of short-term securities) (Bernanke, 2015).

Source: Authors.

These expectations, as mentioned in the previous chapter, are based on the emerging economic outlook and the anticipated reaction of the central bank. If people fear an excessive slowdown in activity, they will

expect a drop in interest rates. The speed and extent of this drop will depend on the way in which the central bank has reacted to similar situations in the past. The impact of these expectations is even greater given that they affect rates not only for bank loans but also for bonds. Arbitrage, facilitated by the use of derivatives, does tend to even out the 'risk-free' rates underlying bank lending rates and bond market rates. These risk-free rates – which depend on the way in which operators expect interbank rates to evolve – go hand in hand with a term premium that increases with the length of the loan (Figure 4) and a credit risk premium that differs depending on the borrower.

Central banks have gradually grown more aware of the way in which they can shape risk-free rates and have learned to wield that influence. They now strive to state their goals and the way in which they plan to achieve them more clearly. For many years, in keeping with the spirit of the times, central banks offered very little transparency. In 1931, in answer to J.M. Keynes' question as to why the central bank refused to explain its policy, the Deputy Governor of the Bank of England, Sir Ernest Harvey, said it was "a dangerous thing to start to give reasons" (Issing, 2005). For decades, many central banks were content to simply release their interest rates at the end of their regular meetings. In the United States, it was not until 1994 that the Federal Reserve actually began doing so after its monetary policy meetings. It had previously simply let markets guess rates by keeping an eye on the way it injected and withdrew central bank money.

Today, in contrast to that long-prevailing opacity, central banks give indications of their assessment of economic conditions and what will likely be their next rate changes. This forward guidance has been common practice for the Federal Reserve since the mid-1990s. In the late 2010s, low inflation and weak growth even led the European Central Bank – long reluctant to give clues as to its future policy – to commit to keeping its key rates unchanged for several years.

However, forward guidance is not the only tool central banks can use to adjust the cost of borrowing. They can further influence that cost – to encourage economic agents to take on debt – by lowering not just risk-free rates but also the associated risk premiums. By buying long-term securities on the bond market, for instance, they can bring down these premiums (which compensate the interest-rate risk and the credit risk taken on by the buyers of fixed-rate bonds). In 2016, the European Central Bank took things even further: in an effort to lower the cost of bank loans and encourage borrowing, it introduced long-term refinancing operations (spanning several years), in some cases at negative rates, effectively paying banks to grant loans, under certain conditions.

2.3 The limits to the influence of monetary policy

The late 2010s revealed the limits of monetary policy. Although central banks have a strong influence on the cost of borrowing, their scope for action is skewed in one direction. A central bank can always raise interest rates sufficiently to curb lending and break an inflationary spiral. The late 1970s, for instance, saw a steady rise in inflation, especially in the United States. With the arrival of Paul Volcker, the Federal Reserve halted the surge by simply shutting off the supply of reserves to the banking system. Interbank rates exploded – rocketing from 11% in August 1979 to 20% in March 1980 – taking bank lending rates with them. Borrowing suddenly contracted, causing a deep recession … followed by a slow but steady fall in inflation. The episode became a textbook case, demonstrating the effectiveness of monetary policy in curbing market activity, albeit with a heavy hand! In contrast, however, the central bank is powerless when there is a need to spur activity but the cost of borrowing is already at rock bottom. While at one end of the spectrum a sufficiently swift hike in interest rates always ends up dissuading potential borrowers, at the other end, even very low rates may not be enough to persuade them to borrow sufficiently. For a company that is planning to borrow to invest, the interest rate is far from being the only parameter it needs to take into account. For example, if a drop in rates occurs at the same time as a drop in demand, it may, at least for a while, opt to refrain from borrowing to pursue new projects.

There are ways out of this impasse in which monetary policy then finds itself. To explore these different avenues, we first need to expand the very rudimentary framework used thus far and picture an economy much closer to the reality of today's world. Like companies, households can take on debt, especially since their expenditure is not limited to consumption alone, as we assumed in our previous example: households also spend to build or renovate their homes. Their spending on consumption and investment in property can in part be financed by borrowing. As a result, households taken together make only a portion of their savings available to companies. This financing capacity, or 'net lending' – their income minus their consumption and their investment – is all that remains available to fund corporate spending. Still, the constraints of the market economy remain the same: in order for households to spend less than their income, companies must borrow to spend more than their own. And, as we have seen, in order to achieve macroeconomic equilibrium, the net borrowing of companies – their investment minus their profits – must be equal to the net lending that households provide at full employment.

Household debt nonetheless extends the influence of monetary policy. Take, for example, the situation in which companies, despite low rates, do not borrow an amount equivalent to the savings households would provide at full employment. If these low rates encourage households to borrow, for either investment or consumption, and perhaps even lead some to set less money aside, their net lending will shrink by the same amount and the corporate borrowing needed to bring the economy to full employment will be lower. Yet this extended influence of central bank interest rates may still not be enough if, for example, despite the reduced net lending from households, corporate borrowing remains too low, or worse still, as was often the case in the 2010s, companies do not even invest all of their profits. Businesses will thus also tend to provide net lending. For the central bank, bringing the economy to full employment will be a huge challenge.

There is another option though. In an open economy, low interest rates can also affect a variable we have yet to consider: exchange rates. If low interest rates cause a country's currency to depreciate, its businesses can expect to gain market shares from the rest of the world. Their exports will increase, the country will import less and its output will grow as a result. If sufficient, this improved trade balance with the rest of the world will allow the country to move towards full employment. Once again, this can only be made possible through additional borrowing. The only difference in this case is that this additional debt will occur elsewhere in the world.

Things work the same for a country as for the agents we have seen in previous cases (Box 4). If its households and businesses taken together buy less from the rest of the world than they sell to it, this implies they are lending it the difference. They can only do so on one condition: economic agents elsewhere in the world must accept to borrow more. This might be the case in a country whose agents tend to spend more than they earn at full employment. By allowing its currency to appreciate, this country can reach full employment without 'overheating'. Some of the spending by its agents – rather than pushing up domestic prices – will propel activity in the country whose currency has depreciated. However, the interests of the world's different economies do not always coincide. If countries elsewhere in the world also tend to spend less than they earn at full employment, they will not allow their currencies to appreciate so easily. Their central banks will cut interest rates in an attempt to prevent it. The central bank of our initial country will thus find itself in a deadlock: if it is unable to stimulate sufficient borrowing either at home or elsewhere in the world to absorb all of the financing capacity of its agents, it will be unable to maintain full employment.

Solving this particular problem requires the intervention of an agent we have yet to factor into our analysis: the government. Like households

and businesses, the government has income and expenditure. Yet, unlike businesses and households, its income does not come from market output: the government's main activity is to provide public services. To deliver these services, it pays wages to its civil servants and offers financial support where needed. This expenditure is paid for by the taxes, duties and contributions it levies on the income of households and businesses: it takes part of the purchasing power that these agents have gained from their contribution to market output and sets the base and rate for these levies.

The government is hence directly involved in ensuring macroeconomic equilibrium. Unlike the central bank, which uses interest rates to spur or curb borrowing and spending by private agents in the economy, the government can itself decide to run a budget surplus[4] or deficit, and thereby reduce or increase its debt. If activity increases too quickly, it can rein it in by increasing levies or cutting back on some of its expenditure. And when, on the other hand, it needs to boost the economy, it can borrow in order to spend what is needed to achieve full employment. By taking on debt, the government can thus help maintain full employment in an economy in which private agents as a whole are not spending all of their income. What is more, it can also help the central bank by directly affecting the distribution of income between private agents. By transferring an increased share of income from agents whose propensity to spend is low to agents whose propensity to spend is higher, it will help bring the economy towards full employment: the former's savings will drop while the latter's spending will increase, and the need for additional debt will be reduced by the same amount.

The increase in debt, whether public or private, is, as we have seen in this chapter, a necessary counterpart to growth in savings. Central banks will of course strive to control the pace at which lending and borrowing grow to adjust it to the desired pace of savings. But debt growth is rarely linear: it follows its own impetus, which stems from the very nature of financial systems and behaviour. As we shall now see, this momentum can lead to explosive booms. Still, it would be dangerous to attribute the observed debt dynamics to financial forces alone without considering the role of the underlying savings pressures.

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[4] In some commodity-producing countries, governments systematically pay their budget surplus into 'sovereign funds', which make provisions against the depletion of exploited natural resources by accumulating assets for future generations.

3. THE FORCES BEHIND DEBT DYNAMICS

Credit plays a central role in ensuring full employment for an economy whose agents do not always spend the entirety of their income. At the same time, the debt resulting from the loans made has often been a significant destabilising factor for economic activity: for more than two centuries, the recurrence of financial crises related to excessive indebtedness has been a striking feature of market economies. This can be explained by the microfoundations of credit. Credit is a gamble on the future, and the future is inherently uncertain.

A loan always involves an element of risk for both lender and borrower. The perception of these risks and the attitudes towards them therefore influence the pace at which loans are granted. Since credit stimulates activity, any increase in the amount of lending naturally tends to have a snowball effect: sustained demand makes animal spirits all the braver making borrowers less reluctant to take on debt. Lenders meanwhile feel reassured and are more willing to lend as a result. This triggers an upward spiral that is further fuelled by a tendency to see the future through the prism of the present: when things are going well, borrowers are inclined to take bigger risks and lenders grant loans more rashly … until reality restores the balance. Borrowers then begin to default, which makes lenders more wary and hampers credit growth. The resulting slowdown in activity brings more defaults, leaving lenders even less inclined to provide funds. The horizon darkens, unleashing a new spiral – this time downward – as boom gives way to bust (Levy-Garboua & Maarek, 1985).

There is nothing new about the cyclical nature of lending and its link to shifting attitudes towards risk. It is an integral part of what we commonly call the business cycle. Still, this alone does not account for the debt dynamics seen since the middle of the last century. To paint the full picture, we must also consider savings behaviour. When savings become a source of deflationary pressure, central banks, as we have seen, adjust their policies to maintain macroeconomic equilibrium … by stimulating borrowing. Of course, the effects of these policies are often amplified by the procyclical nature of financial behaviour. But it is impossible to pinpoint the resulting changes within the conventional confines of the business cycle. The scope is too narrow, since businesses are here the only ones taking on debt. Expanding this to cover a financial cycle, in which households as well as businesses take on debt, is a step in the right direction. Nevertheless, these debt dynamics continue to rely mainly on the

recurrent excesses of the financial system and of those to which it lends. The macroeconomic pressures created by savings behaviour remain largely overlooked. Taking the latter into account gives us a fresh perspective on the financial crises that regularly occur.

3.1 The role of credit in the business cycle

There has been much speculation about the cyclical nature of business since the early 19th century. Everything from good and bad harvests to the movement of sunspots has been put forward as an explanation for the frequent peaks and troughs in economic activity. But credit and its excesses quickly became central to the majority of thinking on the vagaries of economic ups and downs. In the late 19th century, Wicksell was the first to lay the foundations for an analysis of the mechanisms at play (Schumpeter, 1954).

Wicksell and the need to regulate money creation

Wicksell's analysis – which gave us a number of terms still in use today – is based on the difference between two interest rates: the 'natural' rate, rooted in the real economy, and the 'money' rate, which refers to the interest rate on loans granted by banks. Wicksell based his assessment on an economy in which lending is not direct but is instead arranged, with banks as the intermediary. The natural rate is a function of the state of the economy. It depends on the workings of that economy, the scarcity of different inputs, the nature of demand, and so on. This natural rate of interest is a yardstick for macroeconomic equilibrium: if borrowers can obtain loans at this rate, their investment will be equal to the savings created when the economy is at full employment (Marchal & Lecaillon, 1967). However, under the gold standard of the time, the loan rate actually available to businesses – the money rate – is determined by banks, which seek to maximise their profits, and are constrained only by the amount of gold reserves they have available.

To understand the mechanisms at play from Wicksell's vantage point, let us start with a situation in which the economy is at full employment and the money rate is equal to the natural rate. If banks have surplus gold reserves, they will seek to increase the volume of their loans to take advantage of the situation. They will do this by lowering the money rate below the natural rate. Businesses will thus be encouraged to borrow more to invest and, with the economy at full employment, prices will be driven higher. As long as money rates are too low, this spread will persist. Borrowing demand from businesses will not be halted by inflation: the price of the commodities they buy will undoubtedly rise, but so will the

price of the products they sell, leaving their profit margin unaffected. The same goes for the loans offered by banks: the rates at which they lend will drop but the amount of lending will increase, again leaving their profits unaffected. The only ones to suffer the repercussions of rising prices will be those whose monetary income is fixed. The erosion of their purchasing power will force them to consume less, and this 'forced saving' will in turn finance the additional investment sparked by the low cost of borrowing.

These mechanics, which lead to an escalation in debt and inflation, can be triggered not only by a drop in money rates, but also by an increase in the natural rate. This will happen, for instance, if technical – or social – advances improve the expected marginal productivity of capital without banks raising their money rate. Here, again, if the economy is at full employment, the resulting surge in lending will push up prices. This increase will not stop until banks hit the ceiling created by their gold reserves. The growth in demand benefiting businesses will then come to a more or less abrupt halt; some of the expected profits will evaporate … and some of the loans granted will not be paid back. Inflation will give way to a drop in prices … until banks once again find themselves in a position to reduce the money rate or until a change in the 'real' economy increases the marginal productivity of capital. Wicksell ([1935] 1967) draws the following conclusion from this analysis: in so far as we cannot determine how much gold is in the hands of private enterprises, "the only possibility of a rational control of the price level must lie […] in the proper regulation of the interest policy of the banks" (p. 216). Note that this regulation is precisely what central banks are now attempting to implement.

Hayek and the danger of regulating money creation

A few decades later, in 1931, Hayek also began exploring a mechanism triggered by a lending glut to build a theory of a cycle even further rooted in the real economy than that of Wicksell. Yet, he drew very different conclusions with respect to economic policy. In Hayek's view, there is no sense in seeking to stabilise inflation as the general price level is a purely statistical construct that entrepreneurs cannot directly perceive and which therefore has no impact on their decisions. The same does not apply to relative prices. Across all sectors, the profitability of companies hinges on the respective cost of the resources they employ (materials, equipment, labour, etc.) and the goods or services they sell. These prices provide a set of signals that inform business decisions and guide the allocation of available resources. The interest rate is one such signal: it defines the terms on which today's goods are swapped for tomorrow's goods. Hayek was therefore most

concerned with the effect of excessive credit, not on the overall level of prices, but on the system of relative prices determined by the market.

Left to their own devices, markets determine these relative prices depending on the resources available to the economy, existing methods of production and also consumer preferences, particularly their intertemporal preferences, which are reflected in their savings behaviour. The more consumers wish to save a significant share of their income, the more interest rates will drop and the more entrepreneurs will be prompted to invest. Relative prices of capital goods will therefore tend to rise and companies that produce those goods will grow more profitable and increase their output. Their suppliers will then benefit from a surge in demand which, by driving prices higher, will in turn boost their profits … Overall, the ensuing prices in different markets will determine the 'production structure' of the economy: abundant savings will drive down interest rates and increase the roundaboutness in the method of production. Instead of immediately producing consumer goods, entrepreneurs will be encouraged – under the influence of relative prices – to build machines to manufacture other machines that will eventually be used to make consumer goods more efficiently. The economy's potential to produce consumer goods will be increased … provided this lengthening of the production process, which obviously takes time, is not interrupted by a premature drought in available savings …

But what happens if banks – as Wicksell assumed – seek to grant more loans and push interest rates below equilibrium? These lower rates will spur entrepreneurs to borrow to invest. They will push ahead with investment projects and the price of the resources used to produce the necessary capital goods will rise in relation to that of consumer goods. With the economy at full employment, productive resources will be sucked up by these projects, curbing the production of consumer goods. This decline will then provoke a reaction from consumers, who will cut back on saving in favour of spending, which will push up the price of consumer goods. The effect of relative prices will thus be reversed: some productive resources will now be more profitably utilised by the companies that make consumer goods. This will compromise the profitability of newly launched investment projects, leading a number of companies to abandon them altogether. The initial boom will give way to bust. Driven by the borrowing of companies in response to a drop in the rate of bank loans, the lengthening of the roundabout process of production will fizzle out.

The findings for monetary policy are far-reaching and suggest it should target the 'neutrality' of money rather than price stability. Ideally, there would be no change in the amount of money in circulation. Increasing

the supply of money requires bank loans that temporarily boost demand for the goods that borrowers buy in relation to demand for other goods. This warps the system of 'natural' relative prices and leads to a poor allocation of resources. By the same token, any attempt to stabilise the economy that involves injecting too much purchasing power – whether through monetary policy or fiscal policy – risks upsetting natural trends in relative prices. Attempts to prevent a crisis can actually make things worse. Hayek cites the example of Federal Reserve policy between 1927 and 1929, which came at the end of a long phase of expansion in credit, investment and activity, backed by remarkable price stability. At the first signs of reversal, the US central bank sought to prolong the expansion with a policy of 'easy money'. In seeking to delay the inevitable adjustments, says Hayek, this policy only deepened the depression of the 1930s.

3.2 From business cycle to financial cycle

Since the end of the 19th century, lending and borrowing have consistently contributed to the peaks and troughs of economic activity. Time and again, the dangers of excessive debt have been apparent. In this regard, one study spanning several developed economies provides an insightful historical perspective (Jorda et al., 2012). Between 1870 and 2008, the cycles triggered by rapid credit expansion and a sharp increase in debt (measured in terms of the ratio of private debt to GDP) caused deeper recessions, and in some cases spectacular financial crashes, followed by slower recoveries. Yet the same study also sheds new light on the mechanisms at play. Notably, it shows that corporate debt and investment are far from being the only drivers behind the cyclical fluctuations seen over the past few decades. Mortgages, which fund home purchases, have played a central role in shaping credit and do much to explain the rise in private debt seen in most developed economies since the middle of the last century: "The main business of banks in the early 1900s consisted of making unsecured corporate loans. Today, however, the main business of banks is to extend mortgage credit" (Jorda et al., 2016).

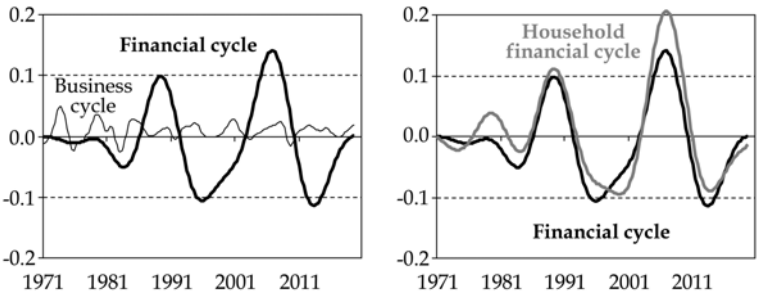
Household credit as a cornerstone of the financial cycle

This observation leaves a question mark over the long-accepted notion that the credit cycle and the business cycle are intimately linked. This should come as no surprise. The real economy has changed immensely since the Second World War. The relative price of capital goods has fallen sharply and companies' financing needs have shrunk. At the same time, the rise in

living standards has enabled more households to buy property – a trend given further impetus by mortgages that are more easily available. Home loans now make up the lion's share of bank balance sheets. After accounting for a relatively small part of those balance sheets in the late 1920s (less than 5% in France and Italy, 25% in the Netherlands and 40% in the United States), home loans surged across the board after the Second World War: by the eve of the 2007-09 financial crisis, they represented close to 50% in France and Italy, 55% in the Netherlands and 70% in the United States (Jorda et al., 2014). A growing share of household savings now finances home building and renovations rather than extending roundabout methods of production.

Economists at the Bank for International Settlements (BIS) have pointed to the existence of financial cycles, distinct from business cycles, and characterised by synchronised fluctuations in total private credit and house prices (Drehmann et al., 2012). These financial cycles – calculated on the basis of data compiled post-1960 for several developed countries including Australia, Germany, Japan, Norway, Sweden, the United Kingdom and the United States – are longer than business cycles. The former have an average length of around 16 years – while the latter span no more than 8 – and they have tended to last even longer since the mid-1980s. They also have a greater amplitude than business cycles (Figure 5). Accordingly, not all recessions coincide with a turning point in the financial cycle, yet a turning point in the financial cycle always coincides with a crisis, and the resulting contractions are much more severe.

Figure 5. Business cycle and financial cycle in the United States, 1971-2019



Note: The graph on the left shows the business cycle (growth, measured by year-on-year change in real GDP, filtered to extract the trend component) and the financial cycle, calculated using the method applied by Drehmann et al. (2012) on the basis of three variables: credit to the non-financial private sector, credit-to-GDP ratio for the non-financial private sector, and property prices. The household financial cycle – shown on the right – is calculated using the same method, in which credit to the private sector is replaced by home loans only.

Sources: Refinitiv Datastream, authors' own calculations.

BIS economists concur with Wicksell and Hayek in suggesting that these cycles begin when the money rate is below the natural rate of interest. This gap triggers upward momentum in private debt. The initial phase sees an increase in the ratio of private debt to GDP. However, this acceleration in borrowing does not necessarily go hand in hand with speedier growth in corporate investment or consumer prices, as in a normal business cycle. The financial cycle begins with accelerated investment in homes, coupled with an increase in property prices. The procyclical nature of the financial system – particularly in terms of attitudes to risk – thus gradually amplifies this trend by way of interplay between favourable financing conditions, sustained income growth, the prospect of rising property prices and recourse to borrowing (Aglietta & Valla, 2017).

This all ties in with the definition of what is now commonly called a Minsky moment. The bullish phase of the financial cycle begins relatively calmly, leading lenders and borrowers to expect it to continue. Little by little, their caution ebbs: the imbalances deepen unseen and the risks taken grow excessive, precisely because everything seems to be going so well, which is often referred to as the paradox of tranquillity.[5] The complacent evaluation of future income and of the assets given as collateral push people to continue borrowing while the financial system continues to rubber-stamp loan applications … until it realises it has gone too far!

Household debt as a lever for monetary policy

The BIS perspective is all the more appealing given that the financial crisis of 2007 seems to have borne it out: have we not seen the dangers of a monetary policy that focuses solely on price stability? This notion of cyclical debt dynamics largely amplified by the financial sphere and driven by risk-blind monetary policy is worth a closer look. First, given that household borrowing in this case plays a more important role than business borrowing, the definition of the natural rate – whose divergence from the money rate triggers an upward debt spiral – is rendered eminently abstract: it is hard to tie this closely, as Wicksell and Hayek could, to the characteristics of the production apparatus employed by firms. Furthermore, on closer inspection, this financial cycle – while distinct from the business cycle – is broadly akin to a credit cycle for home loans.

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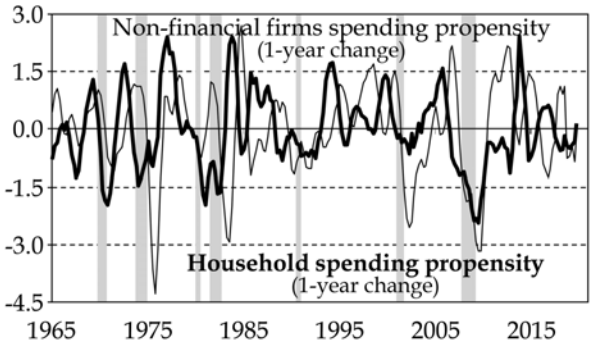
[5] Minsky (1964) developed a different version of his financial instability hypothesis in which financial crises are more severe when preceded by long periods of continuous expansion.

Borrowing the methodology put forward by Drehmann et al. (2012), we can use home mortgages and property prices to compile an indicator whose peaks and troughs largely mirror those of the US financial cycle identified by the BIS (Figure 5, right). This is no trivial observation. It draws attention to the way in which monetary policy has a grip on the real economy. Contrary to popular opinion, the effects of money rates on activity, now largely influenced by central bank policy, initially manifest themselves through household borrowing and residential investment. Investment by businesses then responds to the resulting changes in activity: companies are more attuned to the demand outlook than to the level of interest rates (Brender et al., 2015).

This is easy to see in observing the fluctuations in private agents' propensity to spend in the United States: increases in households' propensity to spend kick start the economy two or three quarters before the spending propensity of businesses follows suit (Figure 6). Still, an agent may spend a greater share of her income because she sets less aside, or because she borrows more. Here again the data are clear: variations in the spending propensity of households are more a reflection of their borrowing behaviour than their financial investment behaviour (Box 5). And this borrowing behaviour quite accurately mirrors changes in the interest rates the central bank attempts to control.

Figure 6. Variation in spending propensity of non-financial businesses and households in the US, 1965-2019 (% of GDP)



Note: Shading denotes recessions as dated by the National Bureau of Economic Research. For each agent, the spending propensity is calculated here as the difference between expenditure and income as a percentage of GDP.

Sources: Bureau of Economic Analysis, Federal Reserve, Refinitiv Datastream.

Consequently, interpreting fluctuations in private borrowing as a phenomenon tied only to the changing nature of attitudes towards risk and a lack of oversight on the part of authorities is over-simplistic. These fluctuations are at least in part a response to efforts by the central bank to mitigate macroeconomic pressures or shocks which would otherwise pull the economy away from full employment. The financial system undoubtedly underestimates the risks of the loans it grants when it grants a lot of them. These loans nonetheless enable those who wish to set aside purchasing power to do so while ensuring their savings do not fetter activity. If these savings are 'poorly allocated', this is not just because money rates are too low in relation to natural rates that are now quite 'unreal'; it is also because the financing channels available to mobilise those savings have not provided a better alternative. This was made all too clear by one of the most spectacular waves of debt of the past few decades and the massive crisis that ensued.

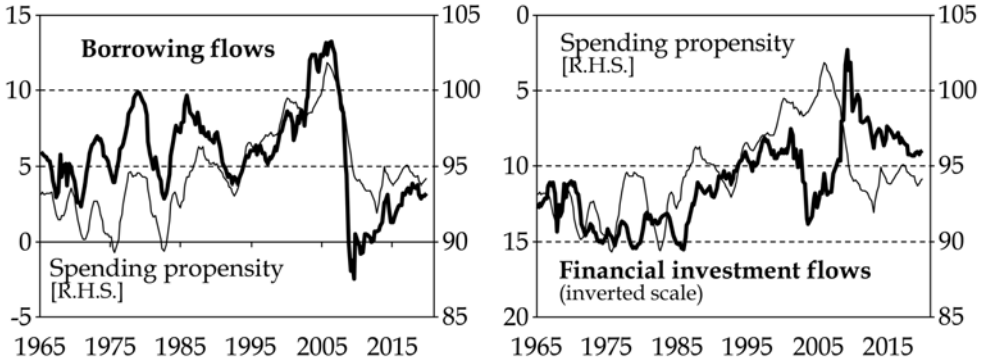
Box 5. Household spending propensity, borrowing and financial investment

Long-term observation of fluctuations in the spending propensity of US households offers insight into the impact of interest rates. This propensity reflects their spending on consumption and investment in relation to income, and can also be defined by the resulting flows of borrowing and financial investment. In order for households to spend more than their income allows, their borrowing must exceed their financial investment. When shown in relation to household income, this gives

Spending propensity -1 = Borrowing rate - Financial investment rate

Since at least 1965, most swings in the spending propensity of US households have mainly reflected their borrowing behaviour (Figure 7). This was borne out by a study of eight developed countries from the early 1990s onwards (Brender et al., 2015). During this time, with the exception of Japan, variations in spending propensity can for the most part be explained by changes in the household borrowing rate. This does not mean household financial-investment behaviour has no impact on spending propensity: a lasting increase (or fall) in the financial investment rate will also cause this propensity to decline (or climb). The persistent drop in the financial investment rate of US households between 1985 and 2000 pushed up their spending propensity. Shorter-term fluctuations in this propensity, however, were mainly influenced by their borrowing behaviour.

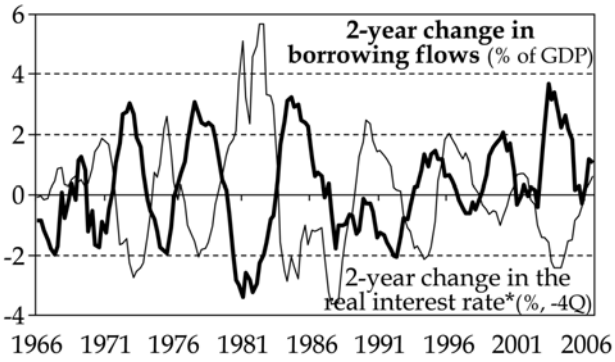
Figure 7. US household borrowing and financial investment, 1965-2019
(% of disposable income)



Sources: Federal Reserve, Refinitiv Datastream.

But what is it that leads households to take on more debt at times? Naturally, there are several factors at play, such as confidence in the future and potential changes in income. That said, the effect of interest rates, and in particular the long-term rates used as a reference for mortgage rates, is always evident (Figure 8). When interest rates drop, households borrow more; when they go up, households borrow less. Household debt behaviour thus plays a central role in conveying the monetary policy impulse.

Figure 8. Monetary impulse and household borrowing in the US, 1966-2006



* The real rate here reflects the difference between the interest rate and average nominal growth in household income over the previous 10 years. The interest rate is a weighted average of the yield on 10-year Treasury bonds (70%) and the federal funds rate (30%); the impact of this real rate on borrowing is felt after four quarters.

Sources: Federal Reserve, Refinitiv Datastream.

3.3 Surges of savings and waves of debt: lessons learned from the global financial crisis

The epicentre of the crisis that shook the global economy in 2008 lay at the heart of developed economies. On the face of things, the central role of US household borrowing and property prices seems to suggest the crisis was the final phase of a financial cycle. Yet this superficial view belies the crux of the matter: the rise in household debt was a response to a surge in savings that risked pulling the US economy away from full employment. Fuelled by the globalisation of trade and finance, this surge came from the rest of the world, however. With global income distribution more favourable to regions with a low spending propensity, and downward pressure on the spending propensity of American private agents, the Federal Reserve pursued a deliberately accommodating monetary policy that fuelled the wave of debt that began to swell in the late 1990s. Unfortunately, nobody thought to check the soundness of the channels used to finance this mounting household debt, not to mention the lack of prudence with which loans were granted.

A series of shocks and deflationary pressures

In the mid-1990s, the Federal Reserve, chaired by Alan Greenspan, successfully used the bond market as a policy tool: by communicating more effectively, it taught market players how to better anticipate the bank's decisions. When, in 1998, the financial crisis broke in Asia, markets immediately knew the US central bank would slash rates. Even before it took action, 10-year yields plummeted by nearly 200 basis points, sinking to 4.5% in October 1998. The reaction in household spending was swift: people borrowed to buy homes and housing investment jumped 15% in two years.[6] This increase – coupled with the upswing in consumer spending – offset the drop in US exports due to the sharp deceleration in growth across emerging regions. Household debt thus helped domestic economic activity withstand the initial shock: while growth in emerging regions fell from more than 5% in 1996 to 2% in 1998 and the global financial system was severely jolted, US growth remained close to 4% from mid-1996 to mid-2000.

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[6] In this chapter and the following ones, specific source references for the extensive financial and statistical data are not given at each instance but are available from the authors upon request.

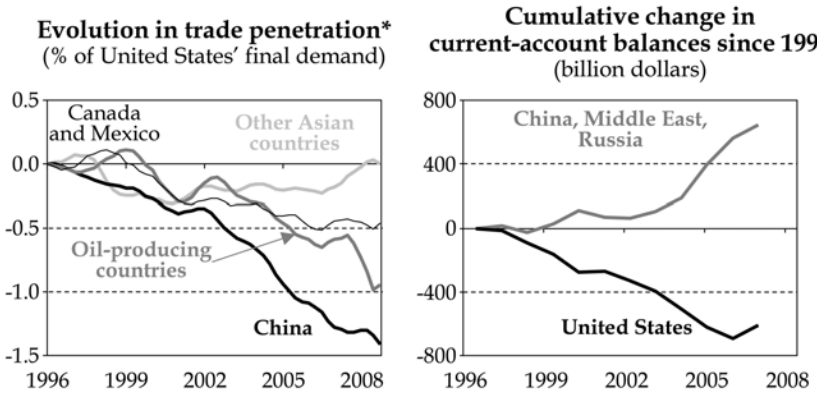
Yet, in autumn 2000, the gigantic stock market bubble that had been building since the mid-1990s finally burst. The United States faced the end of a typically Hayekian cycle. For the first time since the Second World War, while share prices climbed, businesses, egged on by the euphoria of the new economy, did what they had done in the 1920s: they borrowed and invested excessively. Between 1993 and 2000, their investment in capital goods grew by nearly 12% a year. When the bubble burst, the Federal Reserve swiftly slashed its rates, which fell by nearly 500 basis points between December 2000 and December 2021. The central bank knew business spending would remain depressed given the recent surfeit of investment, with households also likely to be impacted by the loss of wealth caused by the market crash. The tax cuts pledged by President George W. Bush during his election campaign admittedly came into effect at just the right time to boost spending; but for the most part, it was the drop in mortgage rates that really prevented a complete collapse by encouraging households to borrow in order to spend more. Despite the scale of the stock market crash (the size of the bubble was the same as that of 1929), the 2001 recession was the least severe of the post-war period. However, other deflationary pressures – less perceptible but equally powerful – quickly flooded in from elsewhere.

In December 2001, China joined the World Trade Organization, gaining permanent access to Western markets. An influx of Chinese products followed from 2003 on (Figure 9). By opening up its economy to a country in which the cost of labour was much lower, the United States agreed – perhaps not fully taking into account the consequences of its actions – to allow China to swallow a growing share of its domestic market. The size and dynamism of the US market, particularly in consumer goods, made it a target for Chinese products, which poured into the country. That was spurred by the fact that between 1998 and mid-2005 the renminbi remained pegged to the dollar, even though annual Chinese inflation was on average more than one percentage point lower than in the United States. China's trade surplus over the United States continued to grow as a result. Within a few years, a rising share of domestic spending in the US market was benefiting China rather than adding to the income of agents in the US economy.

This deflationary pressure was compounded by another, linked to a boom in oil prices: between the end of 2001 and mid-2006, escalating global imports – galvanised by China's growing demand for commodities – caused oil prices to quadruple. As in the 1970s, oil-producing nations, unable to immediately spend their higher share of global income, accumulated current-account surpluses (Box 6). But this time, the surpluses found their counterpart in the United States, not in emerging regions.

Throughout the first half of the 2000s, the United States served as the borrower of last resort for the global economy: the country's central bank, realising the drift in consumer prices was benign, pursued a policy designed to ease the deflationary strain. Long-term yields were kept sufficiently low to enable the surge in US household spending to offset the fact that it was also increasingly adding to the revenues of China and oil-exporting countries. The growth in household debt and the price of homes accelerated, and the rise in housing investments almost perfectly offset the United States' burgeoning current-account deficit.

Figure 9. Change in trade penetration of the US economy and current-account balances, 1996-2008



* The cumulative change in the United States' bilateral trade deficit since 1996 in relation to US final demand is taken here as a measure of 'net' US market penetration by rest-of-the-world economies.

Sources: International Monetary Fund, Refinitiv Datastream.

Excessive strain on financing channels

These developments cannot simply be attributed to the end of a financial cycle; without this build-up of borrowing, the macroeconomic forces at play in the global economy would have dragged the US economy away from full employment. Nor can the stabilising effect of US household borrowing be explained by pointing to a surplus of global savings that single-handedly drove down long-term rates. These rates remained low because the US central bank wanted to maintain full employment in an economy in which a growing share of domestic spending was contributing to income in the rest of the world. This policy, by stimulating US household borrowing, enabled the rest of the world to build surplus savings. Taken as

a whole, the surpluses of China and oil-exporting countries – Ben Bernanke's (2005) "saving glut" – approached $600bn in 2006. They were made possible by a yawning US current-account deficit (Figure 9).

Although the 2007 global financial crisis was not of a cyclical nature, it did, like all financial crises, reveal the effects of the plasticity of financial systems and their propensity to take excessive risks (Box 6). This accumulation of risks was heightened by the fact that the investments by 'saver countries' were mostly risk-free, while the loans enabling those investments were increasingly risky. Over time, borrowing demand from solvent households gradually reached saturation point, but the financial system then found ways to lend to households that did not have enough income to buy homes that were being sold at ever higher prices. Securitisation and the lack of oversight on the part of authorities only compounded the problem: once granted, these subprime loans and their inherent risks were in many cases taken on, through the haze of financial euphoria, by players who were often unable – or unwilling – to appreciate them.

The repercussions were even more explosive given that some of the securities issued were bought by risk-takers who financed their purchases through short-term borrowing in the repo market. When 'realisation' of the inherent risks and a precipitous change in attitudes towards risk suddenly stripped them of this financing, they were forced to panic-sell their holdings to pay off their debts (Brender & Pisani, 2010). This triggered a downward spiral in the US bond market. The haemorrhaging was only halted when the Federal Reserve – after months of deliberation – bought hundreds of billions of mortgage-backed securities and Treasury bonds to relieve private investors of some of the risks they could no longer bear.

Box 6. Surges in savings, the pliability of financial systems and debt crises

Left to their own devices, financial systems have, through sheer pliability, demonstrated a remarkable capacity to cushion the depressive impact of a saving surge by generating a wave of debt. This is clearly illustrated by two financial crises that shook the world economy before the global crisis of 2007-08.

The oil shock of 1973-74 and the Latin American debt crisis

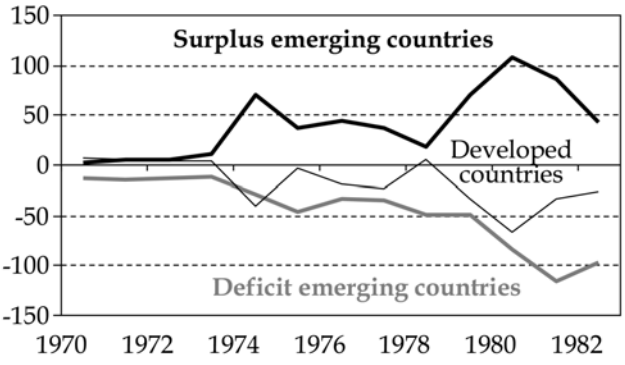
In the space of several months leading up to January 1974, barrel prices virtually quadrupled. The sudden hike shifted a significant part of global income towards countries with relatively small populations that could spend only a portion of those revenues. In a closed global economy, in order for those countries to save, others would have to borrow (Box 4 above). The world had to work out who would agree to borrow and through what channels. From the

outset, the British Chancellor of the Exchequer suggested part of that lending should go through the IMF, but the US Treasury felt financial markets were in a better position to allocate capital (Lubin, 2018).

The infrastructure needed to 'recycle' petrodollars was therefore provided by the eurodollar market, which was in fact a series of banks based outside the United States, mainly in London, which for various reasons granted loans and received deposits in dollars (Goodfriend, 1981). Like elsewhere, their deposits were the counterpart to the loans they granted or that were granted by other banks, based in the United States. The use of 'syndicated' loans enabled several banks to come together in a 'syndicate' to share the risks involved in large loans. What is more, these loans were granted at a floating rate, pegged to the interbank market rate in dollars. The risk linked to an increase in these rates would therefore be borne by the borrower. The surge in oil prices gave this channel of financing an opportunity to significantly increase its throughput.

The eurodollar market made it possible for oil-exporting countries to invest their surpluses risk-free. Although the initial counterpart to these surpluses was provided by the deficits of oil-importing countries, which were for the most part developed nations, the deficits of emerging countries quickly took over. Many of them saw these dollar-denominated loans as a means to accelerate their development. In all, some 15 emerging countries, mostly in Latin America, borrowed huge amounts to pay for a wave of imports … mainly from developed countries. Once the initial shock was over, the current-account balance of these developed nations, taken as a whole, had almost regained equilibrium and oil-exporting countries had achieved a surplus … mirroring the amount borrowed by developing countries (Figure 10).

Figure 10. Change in current-account balances during the oil shocks, 1970-82 (US$, billions)



Sources: Chelem, authors' own calculations.

A second oil shock prolonged this wave of debt: between 1979 and 1981, emerging countries borrowed as much as they had in the five years prior. Meanwhile, in October 1979, the Federal Reserve, in a bid to bring domestic inflation under control, allowed the federal funds rate to rise to unprecedented levels. For countries that had just taken on dollar debt, the effects were disastrous: global growth halted and commodity prices plummeted, slashing their export revenues while their cost of borrowing skyrocketed. The crisis blew up in August 1982 when Mexico said it could no longer service its debt. It took several years to restructure that debt, which came at great cost to the lending banks … and caused a sharp contraction in borrowing countries. Unable to obtain more credit, the latter were forced to suddenly restore their balance of trade by curtailing domestic demand and activity: real GDP per capita in Latin America would not return to its pre-crisis levels until 1994.

European fiscal adjustment in the mid-1990s and the Asian debt crisis

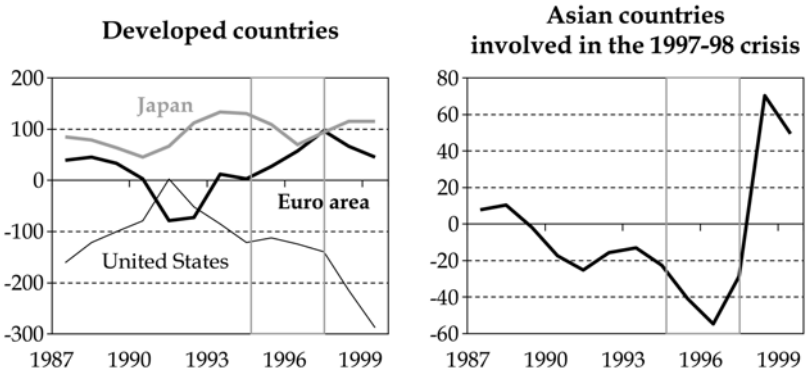
The forces sparking the crisis that erupted in Asia in the late 1990s were more obscure. Here, again, the plasticity of financing channels was key: while fuelling a wave of debt in Asia, these channels also ensured that a sudden surge in savings did not choke growth in Europe.

In the mid-1990s, many European countries significantly reduced their budget deficits to meet the terms of the Maastricht Treaty. Still, their growth remained sustained, even though the net lending of their private agents did not decline. The simple reason for this is that the dramatic reduction in their public deficits was offset by an equally impressive improvement in their current-account balances. France is a case in point. Between 1994 and 1997, there was no change in the net lending position of the private sector, and fiscal adjustment efforts led to an improvement in the current-account balance of nearly 4% of GDP. After reaching equilibrium in 1994, the future euro area hit a current-account surplus of nearly $100bn in 1997, at the same time as growth was accelerating. This surplus could stem only from an acceleration in activity that deepened deficits (or reduced surpluses) elsewhere. While the balances of the United States and Japan deteriorated somewhat (Figure 11), a significant share of Europe's excess savings was sucked up by Southeast Asia, again thanks to the flexibility of established financing channels, for which European banks were a bridgehead.

From the mid-1990s, South Korea, Malaysia, the Philippines, Thailand and Indonesia saw their growth gain momentum and their current-account balances deteriorate. They thereby – unwittingly – 'helped' European countries to absorb a massive fiscal adjustment without harming their growth. The external debt of Asian countries largely took the shape of bank loans and, unsurprisingly, European banks – which were at that point less internationalised than their main US counterparts – played an important role. Within a few years, they more than doubled their exposure in the region: in

1997, their loans outstanding would equal those of Japanese banks, despite the latter's traditional focus on Asian countries. However, lending banks once again avoided taking too many risks: they provided credit in their own currencies through short-term loans to local banks. It was the latter that then took on most of the risks related to the debts piling up in their countries. These risks included the currency risk that the dollar-pegged policy led them to underestimate; the liquidity risk (if foreign banks did not roll over their loans, they would have to repay what they had borrowed); and the credit risk (it was local banks that financed industrial and real-estate projects in their home countries).

Figure 11. Change in current-account balances in the 1990s, 1987-99 (US$, billions)



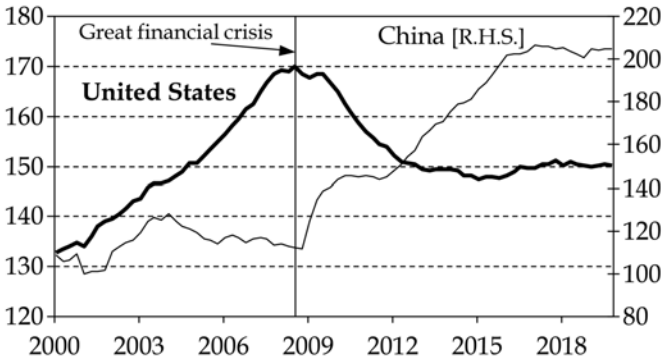
Sources: International Monetary Fund, Institute for International Finance, Refinitiv Datastream.

For several years, the rising price of real estate, bullish stock markets and growth in domestic lending were all self-sustaining. But when the first warning signs appeared, foreign banks shut off the lending tap, forcing local institutions to pay back the currencies they had borrowed. To help them, local authorities used their foreign exchange reserves. Then, as the crisis worsened, they turned to the IMF. In order to then repay the IMF and rebuild their forex reserves, these countries had no choice but to run current-account surpluses, first by abruptly curtailing their domestic demand, then by gaining market shares in the rest of the world thanks to depreciated currencies.

There was no better illustration of the macroeconomic dimension of the 2007 crisis than its ramifications on the other side of the planet. The accumulation of deposits by Chinese households – previously made possible by the loans granted to US households – was suddenly

compromised. To prevent a dramatic slowdown in activity, this time in China, the Chinese authorities were left with no choice but to push their domestic agents to borrow (Figure 12). As of 2008, it was in China that the growth of borrowing, construction and property prices sparked into swift acceleration.

Figure 12. Debt of non-financial private agents in the United States and China, 2000-19 (% of GDP)



Sources: Bank for International Settlements, Refinitiv Datastream.

The lesson is clear: in an economy in which there is no inflation, as has been the case in developed countries for several decades, the resulting waves of debt are far from always being a product of cyclical mechanisms. They stem from the interplay between a monetary policy focused on maintaining full employment and a particularly 'plastic' financial system that is capable of expanding the capacity of existing financing channels … possibly too far. This plasticity of financial systems in developed countries makes them powerful shock absorbers. Yet leaving them alone to mobilise huge amounts of savings all too often leads to tremendous waste.

4. ACCUMULATION OF WEALTH AND ACCUMULATION OF DEBT

For many a decade, debts have continued to pile up around the globe. Between the early 1980s and 2021, total household, corporate and government debt more than doubled relative to world GDP. Sharp increases in debt in one region or another have regularly triggered financial crises (Kose et al., 2020). Yet it would be wrong to conclude we should curb indebtedness at all costs. Every wave of debt fuels a wave of spending that ensures activity is not depressed by a surge in savings. The recklessness of borrowers and those who lend to them should not mask the contribution of savings behaviour to rising debt: in economies in which, at full employment, a portion of income is not spent, debt as a share of GDP is bound to increase.

To understand this, the simplest approach is to look at the way in which the financial wealth of households has evolved in the most developed countries, where living standards are high enough to ensure that, on average, households no longer spend all of their income. Once goods and services are paid for, the rest is typically invested in the financial system, where it serves to grow their wealth. For the most part, as we shall see, these investments lead households to acquire debt claims, directly or indirectly. These claims are everywhere the main means of transferring household purchasing power over time. Equity investments very often play only a minor role. Consequently, to ensure that the propensity of households to hold back part of their income does not hinder economic expansion, a sufficient amount of debt must continually be issued. And when growth in private debt is insufficient to absorb the rise in domestic savings, government borrowing or lending to the rest of the world has to fill the gap. Over the past few decades, more indebtedness has nearly always been needed to maintain relatively full employment.

4.1 Household savings and rising debt

To clarify the relationship between rising debt and the accumulation of savings, we will once again start by looking at a closed economy comprising only two types of agents – households and businesses – with a financial system as an intermediary. Households are the only agent to own businesses, both noncorporate and corporate – either directly or through

the financial system. Of course, the fact that all businesses are owned by households does not mean all households are directly or even indirectly business owners. Still, the value of companies is nonetheless part of their total wealth. This value is equal to the total assets held by companies minus their debt. Assets include the stock of productive capital, both tangible (buildings, equipment, land, etc.) and intangible (patents, knowledge, know-how, etc.). In addition to these 'real' assets, businesses also have financial assets, such as their bank deposits, along with trade credit, loans they have granted, their stakes in other companies and so on. Once consolidated, the financial assets of some companies are cancelled out by the liabilities of others, so if, to simplify matters, we assume businesses are the only ones to take on debt, the value of their stock of productive capital is their only remaining asset. Companies' contribution to household wealth is therefore equal to the value of their 'real' assets minus their net debt. Since we assumed businesses are the only borrowers, their net debt is necessarily equal to the total debt claims held more or less directly by households. The conclusion is simple: the counterpart to the financial wealth of households is the capital stock of the economy. In our closed economy, households, taken as a whole, can only transfer purchasing power over time by investing to increase the stock of productive capital.

The accumulation of household savings ...

Households do not, however, transfer their purchasing power over time taken all together: they do so individually. Their financial wealth consists of two types of assets whose holders take on quite different risks: property rights (equity investments) and financial claims (debt investments). Households acquire these assets over time by saving part of their income. When they do not spend all of their income on consumption or investment in real estate, they acquire financial assets. They may buy securities or keep their savings in the form of banknotes or bank deposits, thereby acquiring claims on the banking system, which are a counterpart to the loans the system has granted. They may also entrust the sums set aside to a savings collector, which will invest them either in financial claims or in equities, according to the level of risk they are willing to take. Regardless of their nature, these investments will increase their financial wealth.

For households to acquire equities directly or indirectly, companies must first issue them.[7] At any given time, while some companies issue shares, others repurchase their own or buy those of other companies, to acquire a stake in other firms, for example. Only the *net* issuance of equities – issuance minus acquisitions and buybacks – can meet equity demand from households, which is itself net of any equities that some choose to sell. By the same token, in order for households to acquire debt claims, some businesses must borrow not only more than others reimburse but also more than others lend. Once again, it is not the gross debt of companies that matters here, it is their net debt: if a company takes on liabilities by borrowing from another company, its debt issuance cannot meet household demand for debt investments.

The question is therefore to determine whether total net borrowing by businesses – the difference between the debts and equities they issue and the claims and equities they acquire – will be enough to allow the economy to approach full employment given household demand for financial investments. In particular, the net indebtedness of companies must increase by an amount equal to the additional debt investments that households wish to acquire. Since equities are a relatively risky asset, a significant share of household savings will always be directed towards debt investments, driving demand for them. In our simplified economy, this demand can only be met by a continuous increase in corporate borrowing: as long as the proportion of debt claims acquired by households rises relative to GDP, the proportion of business debt will also increase.

... implies an accumulation of debt

Widening the scope of analysis makes it possible to loosen this tight bond between household savings and business debt by also considering the liabilities incurred by households, governments and residents of the rest of the world. This in no way changes the arithmetic of indebtedness: as long as, relative to GDP, the debt claims households wish to acquire at full employment exceeds a certain threshold, the relative share of total debt needed to keep the economy close to full employment must also constantly rise (Box 7). The greater the share of household income flowing into debt investment and the lower the level of nominal growth, the higher the level of

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[7] Some households may also invest their savings in noncorporate businesses. But the available statistics often do not permit isolation of this component of household financial investments (see the annex to chapter 4).

debt will climb. If, for example, the share of household income flowing into debt claims is 6% of GDP, nominal GDP growth is 4% and the level of debt already accumulated is equal to GDP, debt as a share of GDP will be 40% higher 30 years later. But if nominal growth is only 3%, the proportion of accumulated debt in GDP will not stop rising until it has doubled, and if nominal growth is 1%, it will continue to mount until it has multiplied sixfold! Maintaining full employment in an economy in which households continue to set aside a significant share of their income despite weak growth thus requires a steady increase in debt to GDP. And even if the total debt ratio stops rising, as we shall see, macroeconomic equilibrium will continue to depend on the respective changes in the indebtedness of the agents.

Box 7. Household investments and rising debt

To simplify matters, let us assume household financial investments only take the shape of debt investments held directly or indirectly. Year after year, their financial wealth W – the stock of debt claims – will increase in step with their financial investments S, in this case, the flow of debt investments, i.e.

$$W_t = W_{t-1} + S_t$$

When shown relative to nominal GDP, this gives:

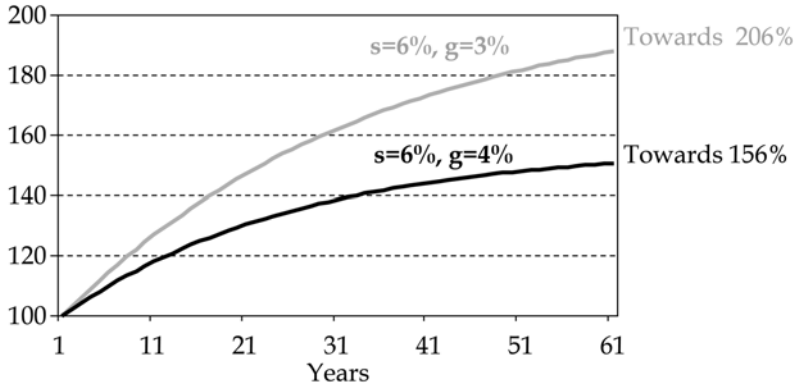
$$w_t = \frac{1}{1+g} w_{t-1} + s_t$$

where g is the nominal growth of the economy, which we assume to be positive and constant; s_t is the flow of household financial investments relative to GDP for period t; and w_t is the stock of debt claims held by households relative to GDP for period t.

When shown relative to GDP, the stock of debt investments held by households will increase as long as the flow of investments s_t is greater than the threshold $s^* = \frac{g}{1+g} w_{t-1}$, which is a function of the stock of debt investments already accumulated and nominal economic growth. If, however, s_t is less than s^*, the share in GDP of debt investments and therefore of accumulated debt will fall.

Lastly, if the flow of investments s_t is stable, equal to $\bar{s}$, the stock of debt investments in relation to GDP will eventually converge towards $\bar{w} = \bar{s}(\frac{1+g}{g})$. Figure 13 shows the change in the financial wealth of households – for an initial stock of debt investments equal to GDP and a flow of investments s equal to 6% of GDP – in two cases: nominal GDP growth of 3% and 4%. The greater the flow of investments relative to GDP growth, the faster the growth in financial wealth … and the higher debt will need to climb to keep the economy at full employment!

Figure 13. Change in the stock of debt claims (… and liabilities) (% of GDP)



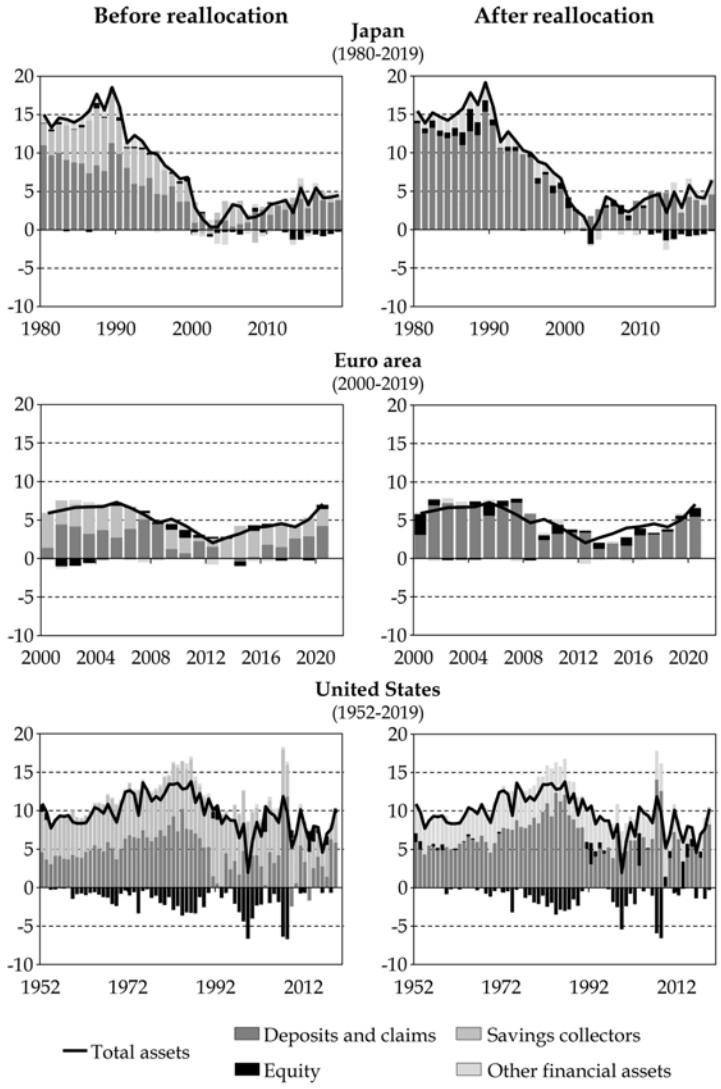
Source: Authors' own calculations.

4.2 Accumulation of financial investments and household wealth

The composition of household investment flows helps us to understand the close connection between household savings and rising debt. In developed economies, direct purchases of shares (in private and public companies) by households represent a very small proportion of their financial investment flows (Figure 14). For the most part, these investments involve deposits and debt securities, or go to savings collectors (mutual funds, life insurance companies and pension funds). Sums entrusted to the latter can of course be invested, at least in part, in equities.

Yet the acquisition of equities by savings collectors also, in many cases, represents a relatively small share of the funds with which they are entrusted. Adding indirect equity purchases to direct acquisitions paints a clearer picture, despite the statistical uncertainty inherent in reallocation (Box 8): *net purchases of equities represent only a fraction of the flow of household investments*. Since 2000, average annual equity investments by households in the euro area have represented little more than 0.5% of GDP, compared with 4.5% of GDP for deposits and debt investments. In Japan, equity investments account for an even smaller share and, since the early 2000s, households have sold more shares than they have bought overall. As for US households, since the early 1970s, they have on average sold equities equivalent to over 1% of GDP each year – with this figure slightly higher for those holding equities directly. Note that this small share of equity investments can also be found in more recently developed countries: in South Korea, for example, this share has on average accounted for less than a tenth of household financial investments since the early 1970s.

Figure 14. Household financial investments before and after the reallocation of assets held by savings collectors (% of national or regional GDP)



Note: Flow reallocation is inevitably approximative. Households are considered to be the only agent investing through pension funds and life insurance. For mutual funds, reallocation is based on the share of household investments in the total stock of mutual-fund liabilities. For the euro area, the calculation is even more approximative due to the greater share of investments in mutual funds of the 'rest of the world' by Italian households towards the end of the period. In the United States, 'other financial assets' for the most part involve here unfunded claims on pension plans (claims on sponsors).

Sources: Bank of Japan, Eurostat, Federal Reserve, authors' own calculations.

Box 8. Difficulties in reconciling flows of debt claims and debt stocks: the US example

The case of the United States is a good example of how hard it is to estimate the total amount of accumulated debt claims. In theory, these claims should have liabilities as a counterpart. Yet, a discrepancy often exists in the flow-of-funds accounts: by the end of 2019, the total value of claims exceeded liabilities by more than $3trn (i.e. 15% of GDP). A third of this discrepancy can be explained by a valuation difference between the debt securities owned and issued: those held are valued at their market price while the issuers' liabilities are valued at issue price. The more market prices stray from the face value of these debts, the greater the gap between the two amounts. The largest part of this discrepancy, however, involves the item 'miscellaneous assets and liabilities'. Here, again, assets exceeded liabilities, this time by nearly $2trn. This may seem a significant amount, but as a percentage of the sums in question, it is still modest: by late 2019, after eliminating the financial sector, the total amount of assets (or liabilities) of domestic non-financial agents and the rest of the world was around $160trn in the US flow of funds.

This discrepancy between the size of financial assets and liabilities highlights another point: the estimated stock of claims owned by households has a good chance of differing from their cumulated flows of debt investments. Adding up these investment flows is complicated, given that it involves isolating which funds entrusted to savings collectors are invested in debt claims. At the end of the period, the gap between the stock of debt claims and the cumulative flows was far from negligible: it amounted to nearly 40% of GDP. Around 7% was due to a valuation gap between cumulative direct bond purchases and the value of the outstanding stock. Most of the remaining difference can be explained by the statistical treatment of defined-benefit pension funds: the Federal Reserve views household pension entitlements as claims (since, even if those pension funds hold equities, households do not bear their risk). There is also a difference between the value of the outstanding stock and the accumulated flows for the unfunded liabilities of these pension funds (claims on sponsors) (Stefanescu & Vidangos, 2014).

Household financial investments lead to an accumulation of debt claims

Since household investment in equities is limited, a surge in savings will lead to higher demand for debt claims. This implies a more or less steady rise in the indebtedness of domestic agents. Asian countries in which households often have a lot of savings are a good example of the mechanics at play. In South Korea, which was still relatively underdeveloped in the

late 1960s, the share of household financial assets was initially small in relation to GDP. However, this was followed by a significant build-up of savings, which led to a yearly flow of debt investments averaging nearly 9% of GDP from the mid-1970s onwards. Despite a particularly rapid rise in nominal GDP, the stock of debt – representing the counterpart to the claims accumulated by households – climbed steadily, increasing more than sixfold between 1975 and 2020 to surpass 170% of GDP. In Japan, the share of debt investments accumulated by households on the eve of the 1980s was already relatively large. Nonetheless, the figure then doubled between 1980 and 2010 to nearly 300% of GDP, with the flow of debt investments remaining particularly high (above 10% of GDP). When this flow subsequently subsided, the stock of debt investments stabilised. Despite weak Japanese growth, the significant stock of accumulated debt now sets a threshold of 5% of GDP, which the flow of debt investments must exceed for the stock to increase further.

In the United States, growth in the stock of debt claims accumulated by households has been less spectacular than in Asia. Stable between the mid-1950s and early 1980s, it has still risen by 50% of GDP since then. With the flow of household financial investments generally surpassing 6.5% of GDP since the early 1990s, accumulated debt claims were nudging 160% of GDP by the end of the 2010s, despite relatively buoyant economic growth. For the euro area, data on the flow of household financial investments only go back to 2000: relative to GDP, the figures were comparable to those for US households until 2008, then tailed off. While relatively stable in France and Germany, the flow of investments by households in southern European countries – which were most affected by the sovereign debt crisis – plummeted. This put a stop to any further rise in the share of debt claims held by European households, which reached 150% of GDP in the aftermath of the global financial crisis. Given the weak growth in the euro area and the relatively small share of accumulated stock, this share will increase again if the flow of household financial investments durably exceeds 4% of GDP.

Over the years, households in developed countries have thus accumulated a significant amount of debt claims at varying speeds. Debt has generally been issued to a sufficient degree to prevent the household propensity for saving purchasing power from over-constraining economic expansion. Before we look at which agents have issued this debt, it is important to clear up a source of ambiguity: the relatively small share of equity investments seen across the board does not mean equities account for only a marginal share of the household wealth.

Retained earnings underpin the value of households' equity holdings

Although they represent only a small portion of the flow of their financial investments, equities account for a significant chunk of households' financial wealth. The United States is a good example, especially since US data make it possible to expand the portfolio of investments by households in public and private companies to include the value of noncorporate businesses of which they are 'shareholders'. For the past five decades, households have usually sold more equity than they have bought. As a share of GDP, the equity they hold directly, after dropping between the early 1970s and late 1980s, has nevertheless risen sharply since then. If we also include equities owned indirectly through savings collectors,[8] the value of the equities held by households has leapt by nearly 75% of GDP since the early 1950s. For the past 50 years, equities have represented a relatively stable share of the financial wealth of households – between 40% and 50% – even though households have practically never stopped selling them!

That is not surprising. Over the years, the increasing value of shares held by households has been driven not by their net purchases of equities – or their contribution to the capital of noncorporate businesses – but by the earnings businesses retain each year after paying taxes to the government and dividends to shareholders. These retained earnings are then reinvested, growing the stock of capital employed. Since households are directly or indirectly the owners of companies, their overall financial wealth grows in step with both the flow of their financial investments (mostly in debt claims) and the earnings reinvested by companies. If we add up the total flow of household investments and the retained earnings of companies year after year, the resulting stock is generally relatively close to the financial wealth accumulated by households (Brender & Pisani, 2001). Of course, there is no reason why this should be exactly the case, especially given that, with respect to the stock of wealth in question, companies are valued on the basis of their market value rather than the amount invested in them (their book value). In the long term, however, looking beyond market peaks and troughs, book values exert a restoring force and market values tend to align with them (Piketty, 2013).

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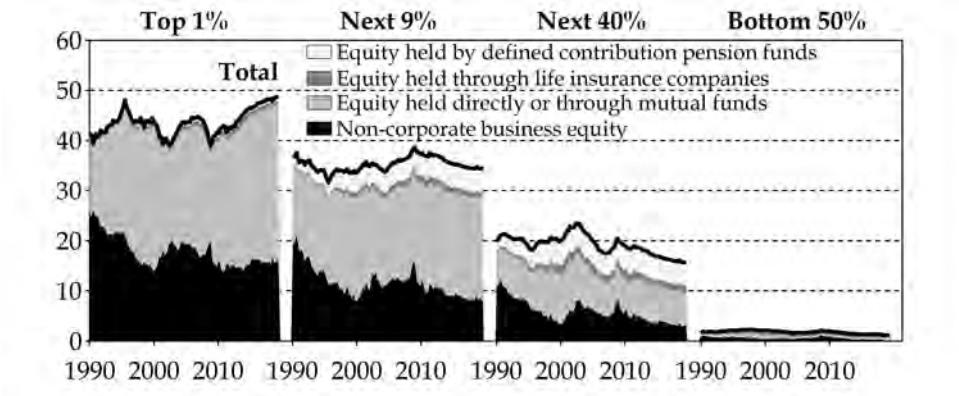
[8] Equities acquired by defined-benefit pension funds are here not included in the equity portfolios held indirectly by households, since they do not take on the risk of fluctuations in the price of these securities. With the amount of their pension being guaranteed by their employer, it is the latter that bears the risk.

Highly concentrated equity ownership

Equities are a riskier asset than debt securities and represent the most volatile component of households' financial wealth. They are also the asset whose ownership is the most concentrated in the richest part of the population. Here, once again, US households, for which data recently became available, serve as an example. In the late 2010s, the wealthiest 1% of US households owned nearly half of the more than $45trn in equities (including equities in noncorporate businesses) held directly or indirectly by all households; the next 9% owned more than a third. In total, over four fifths of equity wealth was in the hands of the richest 10% of Americans (Figure 15)! Note that ownership of noncorporate businesses is even more concentrated.

Figure 15. Distribution of equities held directly or indirectly by US households by wealth percentile, 1990-2019 (%)



Note: Indirect household equity ownership has been distributed in proportion to the share of each decile or centile in life-insurance or pension-fund investments. Since the Federal Reserve does not, in these data, distinguish direct equity holdings from mutual-fund share holdings, equities held indirectly through mutual funds have been added to those held directly; this amount has then been distributed according to the share of each decile in the total for investments in mutual fund shares and equities.

Sources: Federal Reserve, authors' own calculations.

In the euro area and in Japan, equities account for a much smaller fraction of the financial wealth of households than in the United States. For the sake of comparison, if we omit noncorporate businesses, the value of equities held by US households rose from 50% of GDP in the early 1990s

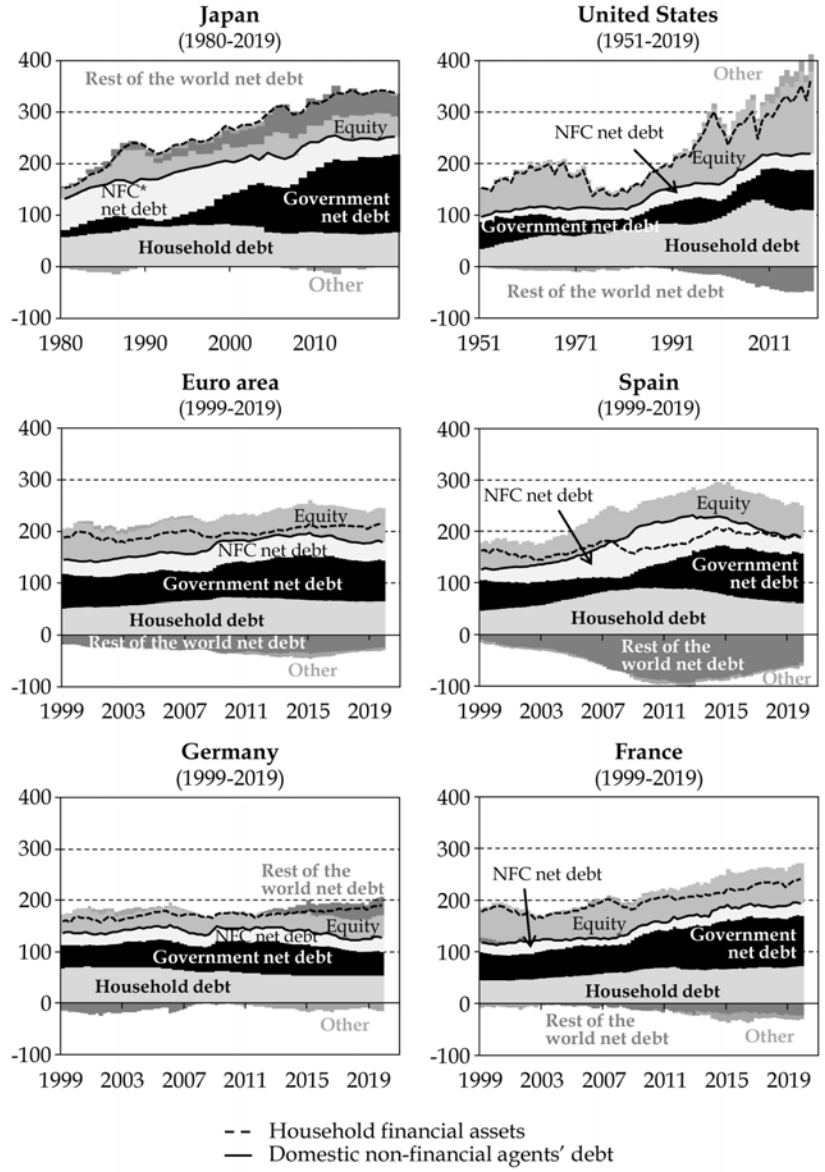
to 150% in 2019; in Japan, household equity investments only briefly topped 75% in the late 1980s at the height of the stock market bubble and are today close to 50% of GDP; in the euro area, household equity holdings have been in the region of 60% of GDP since 2000. Pension financing goes some way towards explaining these differences. In the Netherlands, where, as in the United States, pension funds play an important role, the financial wealth of households relative to GDP is higher than anywhere else in the region, largely due to the role of equities in the counterparts to that wealth.

4.3 Issuers of the debts counterpart to the accumulated claims

In the early 2020s, on the eve of the pandemic, the amount of debt claims accumulated by households seemed relatively stable as a share of GDP, at least in more developed countries. All the same, it is worth taking a closer look at the agents who issued the debts that constitute the counterpart of those claims, as *this provides insight into the conditions in which macroeconomic equilibrium has been maintained over the past few decades*. This also helps clarify why, even if the stock of financial claims held by households has stabilised, maintaining this equilibrium continues to pose problems. The stock of debt owed cannot drop without the stock of debt claims falling. To prevent the economy slipping away from full employment, if one agent pays back its debt, another has to borrow.

There is no better example than the evolution seen in Japan. Since the late 1990s, the total share in GDP of debt claims held by Japanese households has been relatively stable, as we have seen. However, there has been a tectonic shift in the composition of the counterpart debt liabilities. In the space of 20 years, the net debt of Japanese companies relative to GDP fell to 40%, nearly a third of its initial level. Given that the flow of household investments entailed stability in the ratio of accumulated claims to GDP, a more or less satisfying macroeconomic equilibrium could only be maintained by an ongoing increase in claims held on the rest of the world, and, above all, a rise in public debt. From a relatively low level in the late 1990s, the net debt of the Japanese government increased by 110% of GDP in 20 years (Figure 16). Without this continuous ramp-up in government borrowing (and, to a lesser extent, an increase in claims on the rest of the world), deleveraging by Japanese companies would have pushed the Japanese economy towards even more severe deflation.

Figure 16. Counterparts to the stock of household financial assets (% of national or regional GDP)



* NFC: non-financial corporations.

Note: When the net debt of the rest of the world is *positive*, the country is a *net creditor to the rest of the world*; when the net debt of the rest of the world is *negative*, the country is a *net debtor to the rest of the world*. The annex to chapter 4 provides further details of items used in these graphs.

Sources: Bank of Japan, Federal Reserve, Eurostat, authors' own calculations.

The American case is less spectacular. US net corporate debt as a share of GDP did not experience the sharp fall seen in Japan. It was very low until the early 1980s, after which it increased but only slightly (see the annex). The problem of maintaining macroeconomic equilibrium in an economy in which the flow of household financial investments was still relatively high then becomes apparent. The stock of debt investments held by households rose sharply in the 1980s relative to GDP, then resumed its upswing in the early 2000s until the global financial crisis brought things to a shuddering halt. Prior to that, the counterpart to the accumulated claims held by households had increasingly been provided by a rising level of indebtedness … of households. The global financial crisis caused a sea change: from the late 2000s onwards, household debt – which was central to the crisis – began to drop, even though household demand for debt investments remained strong. Given the slow growth in net corporate debt, only a sharp increase in public debt could prevent this demand from depressing activity too much. This swell in government borrowing was all the greater given that, for the past three decades, the United States had been losing market share to the rest of the world and a growing share of debt issued by American economic agents went towards meeting demand for debt claims from the rest of the world, as we saw in the previous chapter.

When viewed across the euro area as a whole, the evolution of the debt incurred by economic agents over the past two decades may also seem underwhelming. As in the United States, the stock of debt investments held by households rose by around 20% of GDP after the global financial crisis and, as in the US, the relative share of debts incurred by households – which until then had been relatively stable – subsequently dropped until the end of the 2010s. With a relatively small contraction in the net debt of companies, an increase in public debt amounting to nearly 20% of GDP was needed to ensure household savings did not depress activity too much. This relative similarity to the United States nonetheless masks a crucial point: the situation developed surprisingly differently between the main countries in the region.

The contrast between France and Germany is particularly striking (Figure 16). In both countries, claims held by households rose significantly, while the relative share of net corporate debt stayed virtually unchanged for two decades. Yet household debt, although rising steadily in France, continued to drop in Germany, revealing an initial difference between the two. Above all, the ratio of German public debt to GDP dropped in the second half of the 2010s … with one major consequence: household demand for debt claims could only be met through increased acquisition of

debts issued by the rest of the world. In France, the exact opposite happened: following the financial crisis, growth in household debt to GDP slowed slightly, but because an increasing share of debts issued in the country were being acquired by the rest of the world (due to a current-account deficit), the ratio of public debt to GDP did not fall as it did in Germany. Instead, it rose to prevent household demand for debt investments pulling the economy too far from full employment.

Of the other major eurozone countries, Spain is the one in which the evolutions most mirrored the mean, albeit with some notable swings in amplitude: the net debt of corporations, in particular, rose by more than 50% of GDP in the 2000s … then fell by the same amount the following decade. Household debt underwent similar changes, escalating in the period leading up to the global financial crisis then falling. From that point on, the increase in government borrowing had to single-handedly meet households' demand for debt investments. Two factors helped limit this rise, however. First, by allowing its economy to drift a long way below full employment and by improving its competitiveness to some extent, Spain successfully reduced its external deficit and, in so doing, reduced the share of its residents' debt held by the rest of the world. Second, precisely because the country moved away from full employment, the acquisition of financial claims by households fell sharply.

These observations show how economic development leads households to hold a steadily increasing amount of financial assets. In part, this progression is the result of the rising value of companies, which they directly or indirectly own. In most advanced economies, this rise is largely due to the retained earnings reinvested by businesses to build up their stock of productive capital. In all cases, the savings of households almost exclusively lead to an increase in their stock of debt claims. And in all cases, the relative share of net corporate debt, which is one of the possible counterparts to this accumulation of claims, is relatively low or falling. Consequently, in advanced economies at least, maintaining macroeconomic equilibrium is today most often a matter of *determining whether households or governments should borrow the sums households wish to invest when they want to transfer purchasing power over time*. We now turn to exploring the factors that determine – and limit – this borrowing behaviour.

Annex. Clarification of our statistical handling of financial accounts

Financial accounts – which include all the financial assets and liabilities of agents in an economy – offer valuable yet complex insight. Accounting systems can differ from one country to the next and give rise to a raft of statistical challenges linked to accounting discrepancies, unidentified assets and liabilities, etc.

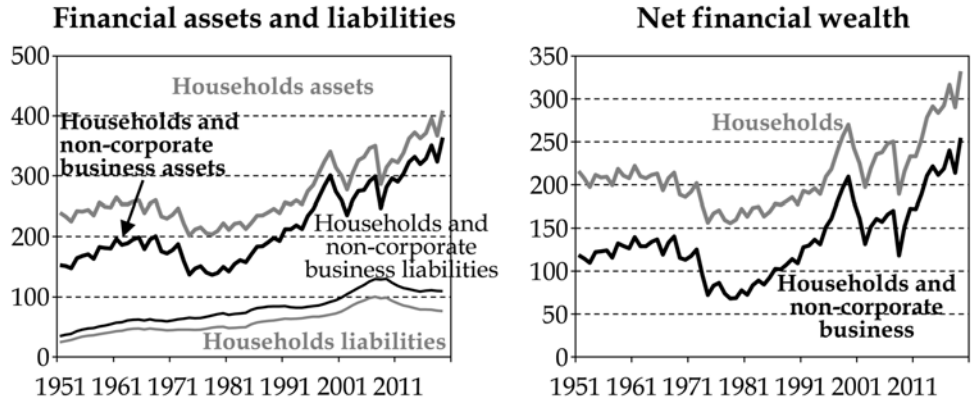
Noncorporate businesses

Although non-profits are always included in the household sector, in the euro area and in Japan this sector also includes noncorporate businesses. In the United States,[9] however, they are treated separately, and in France, central bank data can be used to distinguish them. In the United States, the financial liabilities of noncorporate businesses have continued to climb, as have their financial assets: after a sharp rise in the 1960s, their net debt has fluctuated at around 12% of GDP. In France, the indebtedness of noncorporate businesses has remained relatively stable since the mid-1990s, at around 7% of GDP. Their liabilities net of their claims have been even lower, at below 1% of GDP, since 2017. In both countries, this share has therefore remained modest relative to overall household debt.

For the United States, in Figure 16, non-financial noncorporate businesses (L.104) have been added to households (L.101) for the sake of consistency. This treatment reduces the amount of financial assets held by households. Consolidating the two sectors removes the value of their equity in noncorporate business, which stood at over $12trn in 2019. Real assets which were a counterpart to some of this equity were estimated at around $15trn in 2019. Still, this consolidation does not alter the evolution of household financial wealth (Figure 17).

[9] Note, however, that in the flow-of-funds accounts of the Federal Reserve, hedge funds are assigned to the household sector. Since 2020, a balance sheet has been made available for these funds but the data only go back to 2012. By the end of 2019, their financial assets totalled $2.4trn and their debt $770bn.

Figure 17. Financial assets and liabilities of US households including and excluding noncorporate businesses, 1951-2019 (% of GDP)*



* Throughout chapter 4, the financial assets and liabilities of agents do not include 'miscellaneous assets' or 'miscellaneous liabilities' for the United States.

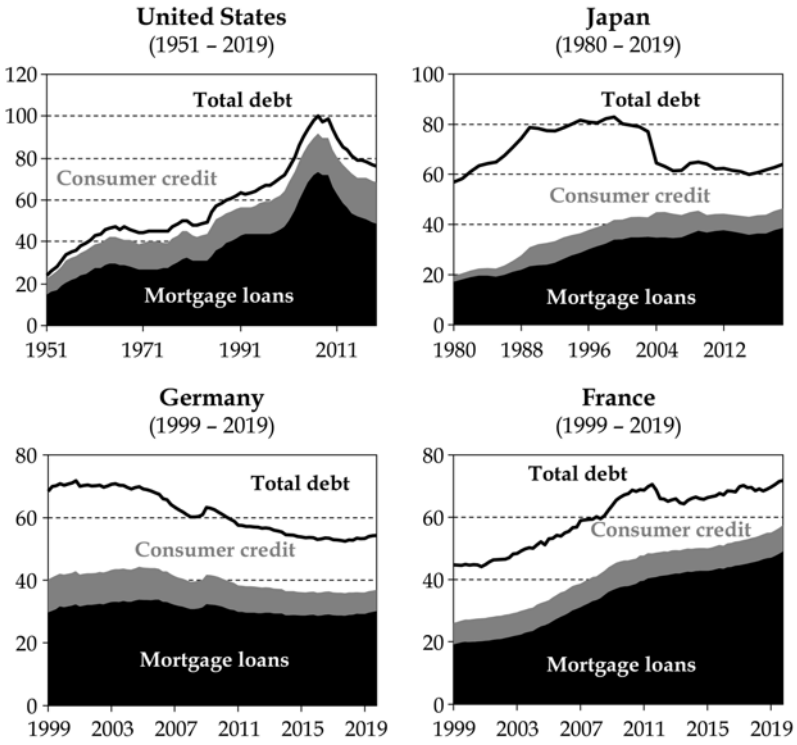
Source: Federal Reserve.

Measuring household debt

It is not always easy to measure household debt (Davydoff et al., 2004). The lion's share of the financial liabilities of households in the euro area consists of 'loans' (F4 in the European System of Accounts), yet this heading does not include all of their debt. Part of it is included in 'other accounts receivable/payable' (F8), which includes trade credit (3% of household liabilities in 2020) and 'other accounts payable' (8% of household liabilities in 2020). In contrast to what we have done for the United States, in this chapter all assets and liabilities as stated in the national accounts are taken into account for households in both the euro area and Japan.

The scope of household debt in chapter 5 is narrower, including only home loans and consumer credit. While the level of debt may differ, the trends remain similar for the United States, France and even Germany. The trend is quite different in Japan, however, due to the steep decline in the debt of noncorporate businesses in the early 2000s (Figure 18).

Figure 18. Gross household debt (% of GDP)*



* Excluding noncorporate businesses in the United States.
Sources: Bank of Japan, Eurostat, Federal Reserve.

Measuring corporate debt

The United States also has an entry entitled 'miscellaneous assets and liabilities' for the non-financial business balance sheet. This total is quite high relative to GDP. It encompasses both equities and bonds, which cannot be separated. Assets for this item also include goodwill, which reflects the difference between the acquisition price and the fair value of the acquired company. In chapters 4 and 5, we have excluded these miscellaneous assets and liabilities from our analysis. Given the extent to which market prices affect goodwill, net debt calculated in this way is less erratic than total net debt. In addition, the unfunded claims towards defined-benefit pension funds ('claims of pension funds on sponsor') have been removed from the debt of US businesses. These liabilities fluctuate noticeably with market prices. In the case of businesses, they are relatively unimportant because the majority of funds of this type now involve the public sector. For the sake of consistency, in this chapter, these claims have

also been removed from the total financial assets of households. Lastly, as in the Integrated Macroeconomic Accounts of the Federal Reserve, we have treated direct investments as equity investments. For Japan, direct investments have been allocated as equities and bonds using balance of payments data. In the euro area, the financial assets and liabilities resulting from direct investments are recorded as debts or equities, according to their type.

5. THE LIMITS TO PRIVATE INDEBTEDNESS

In advanced economies, the savings that households are willing to put into debt investments are central to the problem of maintaining macroeconomic equilibrium. This may come as a surprise. The fact that households choose not to spend all of their income should in fact be an opportunity for the rest of the economy, not a problem: by postponing some of their spending, they pave the way for others to spend more than they earn, without pushing the economy beyond its potential.

Businesses might naturally be expected to be the first to seize this opportunity. On paper, all they need are investment projects liable to offer sufficient returns to offset the debts incurred to finance them, plus a profit margin to cover the risks taken. However, they also require channels of financing to obtain loans, along with the productive capacity to seamlessly manufacture the capital goods they need. The inertia of the 'structure of production' highlighted by Hayek is a reality that cannot be overlooked: a drop in household spending on clothes does not necessarily imply productive capacity is available for machine tools! Above all, firms will only decide to invest if they believe there will be sufficient demand in the future to make full use of their assets. In a developed economy, growth in demand is moderate and there is already a significant stock of capital: the expectation that household savings might be used exclusively to finance investment in productive capacity is a vain hope because, as we shall see, the financing needs of firms are low.

Maintaining macroeconomic equilibrium therefore involves expanding channels of financing in the direction of households. Yet here again, there are some significant impediments to borrowing. Unlike a company that borrows to invest, a household that takes on debt to buy a car or a home does not increase its revenue potential. If its income does not grow – and even more so if it drops – the household will need to reduce its consumption to repay what it has borrowed. But consumption can only be compressed to a certain extent, which means a household's ability to repay loans – and thus the amount it can borrow – is limited by the level of its income. This constraint is strong for the short-term loans used to finance consumer spending. At the same time, it has less of an impact on home loans because the debt incurred most often takes the place of rent and, since mortgages involve long-term credit, the burden is normally eased over time by an increase in nominal income. Albeit less severe, the income constraint remains nonetheless.

Maintaining macroeconomic equilibrium can be further complicated by the fact that while debt limits affect private agents, there are no such restrictions on how much households may wish to set aside. In the short term, savings behaviour, unlike financial investment behaviour, suffers no inertia: savings 'shocks' can occur regularly. There is no better example than the surge in savings seen during the spread of Covid-19 in 2020, at least in advanced economies. Beyond these economic shocks, however, there is no reason why household financial investment behaviour should of its own accord be consistent with the limits on the borrowing of private agents.

5.1 The limits to corporate debt

The limits we explore here are macroeconomic in nature. The goal is not to examine solvency-related restrictions on companies, or to consider the constraints created by their equity capital or the way in which banks ration the loans they grant firms. The aim is simply to see how high their net debt can climb relative to GDP. This debt is one of the possible counterparts to the financial claims that households accumulate.

Let us start with a simple observation: in developed economies, the ratio – which we will call k – between the value of the stock of productive capital used by the corporate sector (net of depreciation) and that of nominal GDP seems relatively stable. Since the middle of the last century, relative to GDP, the value of this capital stock at historical cost[10] has indeed remained close to 0.7 for US companies. This stability may seem surprising. The ratio actually reflects the impact of a number of factors whose changing values have no apparent reason to cancel one another out. First and foremost, it gives a very specific measurement of the 'productivity' of the capital stock used by non-financial corporations in the United States: a net stock of capital that cost them \$0.7m is associated with a production of annual GDP totalling \$1m. Since this output is not produced by these firms alone, but by the whole of the US economy, k depends on the relative contribution of these non-financial companies to economic activity. And since the stock of productive capital taken into account is net of depreciation, its value also depends on the depreciation rules applied to its

[10] This stock includes all non-financial assets of companies (property, equipment, patents, etc. as well as their inventory of commodities and finished products).

different components. Likewise, k is also affected by changes in the productive capital prices relative to GDP prices (Box 9).

Box 9. Determinants of the evolution of the net debt of companies relative to GDP

The net debt of companies increases every year according to their net borrowing minus their net equity issuance. Thus:

$$D_t = D_{t-1} + NB_t - NEI_t$$

where D_t is the stock of net corporate debt for a given date *t*, NB_t is the flow of net corporate borrowing at date *t*, and NEI_t is the flow of net equity issuance at date *t*.

If initial debt D_0 is nil, this gives:

$$D_t = \sum_{i=1}^{t} NB_i - \sum_{i=1}^{t} NEI_i$$

Net borrowing by companies represents the difference between their net productive investments *I*, including inventory changes, and their net savings *S*, i.e. their undistributed profits. Hence:

$$NB_t = I_t - S_t$$

The net capital stock of companies *K* valued at its historical cost is equal to their total previous spending on investment minus depreciation, i.e.

$$K_t = \sum_{i=1}^{t} I_i$$

Therefore:

$$D_t = K_t - \sum_{i=1}^{t} S_i - \sum_{i=1}^{t} NEI_i$$

If we assume k – capital stock relative to GDP – to be constant, the share d of debt relative to GDP is:

$$d_t = k - \sum_{i=1}^{t} S_i / Y_t - \sum_{i=1}^{t} NEI_i / Y_t$$

Assuming a stable flow of corporate net savings relative to GDP (s) and of net equity issuances relative to GDP (nei), we can see that, as in Box 7 of chapter 4, corporate debt will converge towards:

$$\bar{d} = k - \frac{1+g}{g}(s + nei) \approx k - \frac{s}{g} - \frac{nei}{g}$$

where g is the constant growth rate of the economy (assumed to be strictly positive).

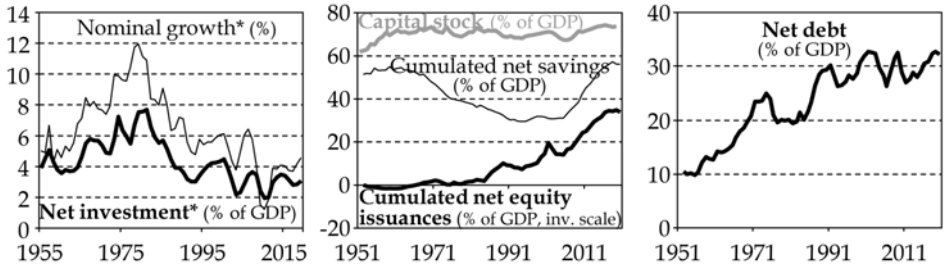
This shows k is the upper limit for corporate debt relative to GDP. Since companies need a minimum amount of equity capital before they can borrow, they must retain at least some of their earnings or continually issue equities: their net debt-to-GDP ratio will be lower the higher the flow s of undistributed profits relative to GDP and the higher the flow of equities issued relative to GDP (nei). If, however, companies continually buy back their shares, their net debt as a share of GDP will converge towards a higher level, without exceeding k, since $(s+nei)$ cannot be negative.

United States and Japan: falling interest rates can have a very different impact

Our aim is not to explain the relative stability of k but to show that its value sets an upper limit to the net debt of non-financial companies relative to GDP (Box 9). This limit would be reached if these companies always financed the acquisition of all capital they employ exclusively through debt. As we saw in the previous chapter, this is by no means the case: every year, they retain some of their earnings (their net savings) and use that money to finance some of their investments. The higher the share of these net savings relative to GDP, the less they will need to borrow and the further their net debt will be below the limit defined by k.

The United States is a good case in point. The value of k puts this limit at around 70% of GDP. Since economic growth in the country remained buoyant during the second half of the last century, investment by companies remained high and their net debt-to-GDP ratio, which was very low after the war, slowly climbed. In the early 2000s, however, the rising share of retained earnings relative to GDP should have reversed this trend – especially since the slowdown in nominal growth led to a reduction in the net investment of companies. Nevertheless, their financial behaviour halted any decline in their net debt, as they regularly repurchased their shares or bought those of other companies (through mergers and acquisitions, for example). The global financial crisis was a notable turning point. US companies adapted their financing preferences to take advantage of low interest rates, as a result of which equity financing was partially replaced by debt financing. The accumulation of debt investments rose, making it easier to maintain macroeconomic equilibrium (albeit at the risk of making some companies more vulnerable to an economic reversal). By the end of the last decade, despite these buybacks, the net debt of US companies represented just over 30% of GDP (Figure 19), just a seventh of the debt of US agents held by households or the rest of the world.

Figure 19. Factors affecting the net debt of non-financial corporations in the US, 1951-2019



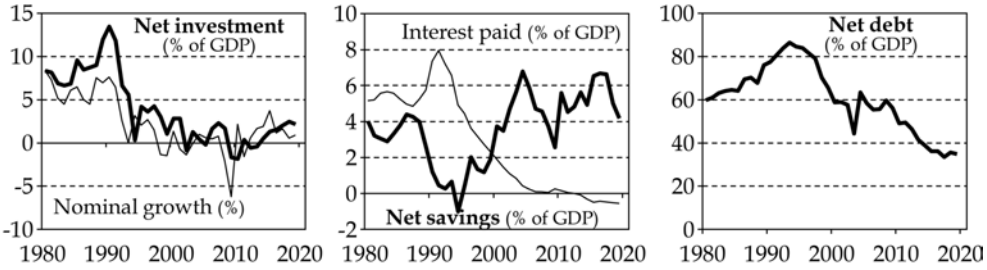
* Three-year moving average.

Source: Federal Reserve.

In Japan, things followed a very different path and the drop in interest rates had a very different impact. The upper limit for the ratio between productive capital and GDP was almost double[11] that seen in the United States. In the early 1990s, the net debt of Japanese companies exceeded 80% of GDP, due to the use of borrowing to finance a large part of the massive investments of the previous decades (Figure 20). The slowdown in growth that followed upset the financial balance of Japanese companies. Their net investment plummeted from more than 13% of GDP to zero in the early 2000s. It remained virtually nil until the middle of the 2010s. At the same time, the net savings of companies, after falling during the crisis, climbed then levelled off at close to 6% of GDP. For the most part, this increase was due to the effect of interest rates, which quickly dropped to zero, reducing the debt burden of companies and allowing them to reduce their indebtedness by several percentage points of GDP within two decades. Thus, starting from a high level of corporate debt, the decline in interest rates – far from making it easier to match debt financing to demand for debt investments – actually made it more difficult (although it undoubtedly ensured the survival of many companies)!

[11] In the absence here of a direct measure of *k* at historical cost, an estimate can be made by comparing corporate investment relative to GDP with nominal economic growth.

Figure 20. Factors affecting the net debt of non-financial corporations in Japan, 1980-2019

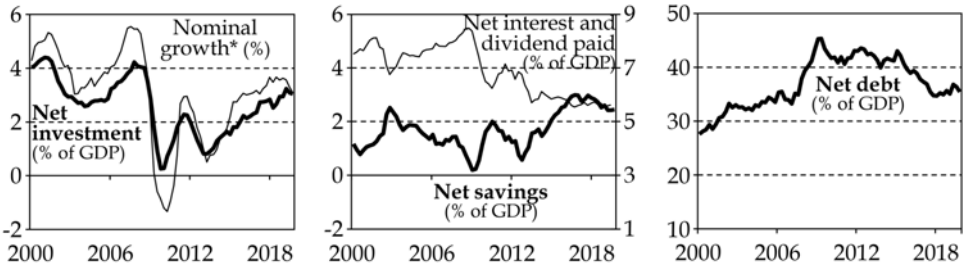


Source: Economic and Social Research Institute.

Net corporate debt also low in the euro area

Despite the relatively short period covered by these observations, the case of the euro area is nonetheless enlightening. Once again, it shows why the debt of companies is far from being enough to meet household demand for debt investments. In the 2000s, the net savings of companies represented a relatively stable share of GDP, fluctuating at around 1.5%. But, their net investment, which was also stable, greatly exceeded their savings: their net debt slowly rose relative to GDP, from just under 30% of GDP in 2000 to 35% in 2007, then 45% in 2009 in the midst of the global financial crisis (Figure 21). This upward trend was then suddenly reversed: between 2009 and 2016, the retained earnings of companies relative to GDP rose by around 3% due to the combined effect of falling interest rates and a drop in dividends paid. Notwithstanding the rise in their rate of investment, which had fallen during the crisis, companies were a durable source of net lending: at close to 1% of GDP on average since 2009, their surplus savings brought their net debt down to 35% of GDP in 2019. In total, for the period as a whole, the net debt of companies represented just a fifth of the total debt of European agents held by households or the rest of the world.

Figure 21. Factors affecting the net debt of non-financial corporations in the euro area, 2000-19

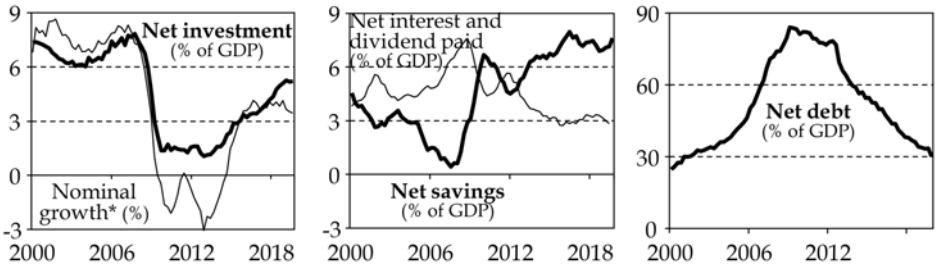


* Average growth over two years, with a lag of one quarter.

Sources: Eurostat, Refinitiv Datastream.

The situation obviously varies greatly between different countries in the euro area. Although productive investment fell across the region after the 2007 financial crisis, the savings of non-financial companies in France and Italy were barely enough to cover their capital spending. By contrast, German companies and Spanish companies, to an even greater extent, built up a large surplus of savings. In Spain in particular, the net savings of companies improved thanks to a fall in the wage bill, which shrank by 2% of GDP, and above all to a drop in their interest expense. For most of the 2010s, Spanish companies were a source of net lending equivalent to 5% of GDP. Despite an increase in their productive investment, their net debt relative to GDP continued to slide, eventually levelling off at around 30% ... as in the early 2000s (Figure 22). Having represented nearly 40% of the debts of Spanish agents held by households and the rest of the world, the net debt of companies was down to only a sixth in early 2020!

Figure 22. Factors affecting the net debt of non-financial corporations in Spain, 2000-19



* Average growth over two years, with a lag of one quarter.

Sources: Eurostat, Refinitiv Datastream.

The low net debt of companies in virtually all developed economies may be surprising. Particularly since observers often worry about their excessive debt. Yet, the above examples concern non-financial companies taken as a whole: their average debt is low relative to GDP but the debt of some individual companies may well be worryingly high. What is more, total gross debt for companies – again taken as a whole – in some cases greatly exceeds their net debt. These companies develop financial strategies that can lead them to borrow well beyond what they need solely to increase their productive capital stock. Some take advantage of relatively easy access to credit to lend to customers or suppliers who do not enjoy the same benefits. Some use low interest rates to boost their cash flow. Others borrow to finance an investment in a foreign subsidiary or to lend to individual companies that are part of their group through complex financial arrangements mainly designed to reduce their taxes (Levy-Garboua et al., 2020). These transactions, while increasing the gross debt of the corporate sector, do not usually increase its net debt, given that they have a counterpart in the loans granted by other companies. As we have seen, the only exception is the portion of this debt used to finance equity investments.

This allows us to draw the following conclusion. Assuming k is relatively stable, the change in the net debt of companies relative to GDP essentially depends on two factors: the pace of growth of the economy, which calls for a productive investment effort on the part of companies, and the share of retained earnings relative to GDP, which measures the funds they have available to finance that investment. More sustained growth will urge companies to borrow and invest more. On the other hand, a drop in corporate taxes or interest rates could have the opposite effect, in that retained earnings may be the only factor to rise … In any case, at least in advanced economies, the net debt of companies has little chance of meeting the bulk of household demand for debt investments. To show this, in the interests of simplification, we will assume k to be equal to one (its value in Europe and in the United States is somewhat lower). We will also assume retained earnings of 1.5% relative to GDP, which is the lower limit of the average values seen in the past: if nominal growth is 5%, which is significantly higher than the averages for the last two decades in the United States and to an even greater extent in Europe, the net debt of companies will converge towards 70% of GDP. Even with such deliberately favourable values, we are still a long way from the 150% to 200% of GDP for the debt claims accumulated by households in advanced economies.

5.2 The limits to household debt

As we have seen, for decades now, household indebtedness has significantly expanded the total pool of debt claims to be held. The limits to the expansion of household debt are a lot more flexible than those affecting corporate debt. Obviously, the borrowing capacity of households is bridled by their income. Even so, for a given income, this capacity will depend on available interest rates and the type of financing channels in place. In all advanced economies, households have access to two types of loans: consumer credit and mortgages, the terms of which differ from one country to the next.

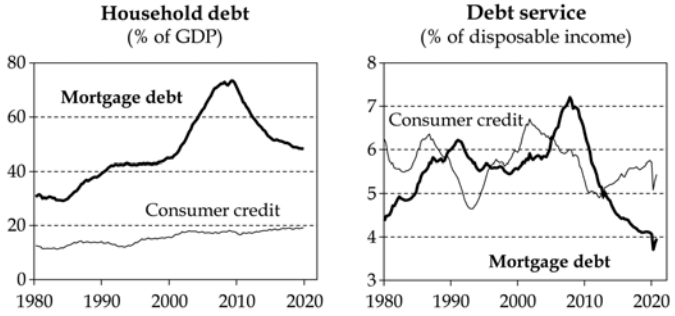
Consumer credit represents a relatively small share of household debt but costs a lot

Over the past few decades, consumer credit has almost everywhere shrunk as a share of total household debt, which has mainly mirrored the curve of their home loans. Although the relative share of consumer credit is low, these loans nonetheless have a significant financial impact on household income. The length of consumer loans is fairly short and interest rates are typically high, especially for unsecured loans. These rates include a significant risk premium, which leaves them relatively unaffected by changes in the risk-free rates managed by the central bank. And although consumer credit certainly enables households to spend now what they hope to earn later, it is not of much use to monetary policy: a drop in risk-free rates can only slightly increase the ability of households to borrow in this way.

The United States is an exception to the extent that consumer credit outstanding has continued to grow, totalling close to 20% of GDP by the end of the 2010s. Yet this progression is in part due to the extended term of car loans (which has risen from three to seven years in the past few decades) and the existence of an original channel of financing in the shape of student loans. These loans – granted by banks but guaranteed for the most part by the government – have an 'extendable' term in that they can be restructured according to the repayment capacity of borrowers. The nature of the legal apparatus and judicial system also helps explain the relatively high proportion of consumer credit: for example, it does not take long to repossess a car if someone defaults on payment in the United States. Meanwhile, personal bankruptcy legislation has done a lot to protect borrowers since the late 1970s, which has doubtless made recourse to credit less risky in the eyes of some: more protection encourages the use of unsecured credit, such as credit cards and personal loans (Severino & Brown, 2020). Still, this is tempered by the fact that US household finances hinge on their credit score, which is lowered by insolvency (Gelpi & Julien-

Labruyère, 1994). In total, even though consumer credit represents barely a quarter of borrowing by US households, it is now a bigger burden on their income than mortgages (Figure 23).

Figure 23. Debt and the debt burden of US households, 1980-2020



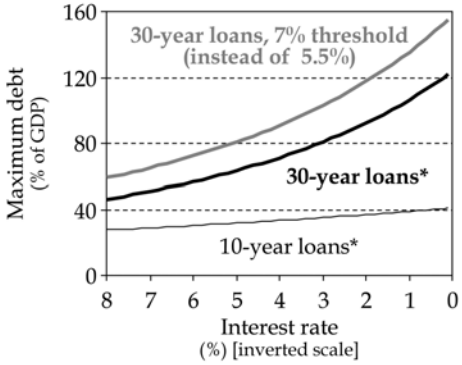
Source: Federal Reserve.

Mortgage borrowing capacity is highly sensitive to interest rates

Across the board, mortgages are a core component of household borrowing and, as we have seen, they are also key to the workings of the financial system. Their sensitivity to long-term rate changes makes them crucial in maintaining macroeconomic equilibrium. These loans are often secured using the property itself as collateral, which considerably reduces credit risk for the lender: interest rates therefore include a much lower risk premium than consumer loans and will tend to mirror changes in risk-free rates quite closely. And since these loans tend to span fairly long periods, a swing in long-term rates can expand (or reduce) household borrowing capacity to a significant degree.

To illustrate the leverage these loans give to a change in the level of interest rates, let us consider 30-year loans, which are the standard for fixed-rate mortgages in the US. We will assume the cost of servicing this debt has to remain below 5.5% of household income, a value close to the average seen in the United States since the early 1980s. At the macroeconomic level, this limit represents the constraint that household income imposes on household debt. It reflects the caution of lenders and borrowers. Note that this limit, defined here for households as a whole, indebted or otherwise, can be largely exceeded by the average for indebted households. We will assume household income represents 75% of GDP, as in the United States. If the 30-year mortgage rate is 6%, then the upper limit for total household borrowing is just over 55% of GDP, based on our assumed debt service threshold. If rates now fall to 3%, this limit will increase by nearly 25% of GDP (Figure 24).

Figure 24. Household mortgage debt capacity as a function of interest rates and maturity of loans



* With a mortgage debt service threshold at 5.5% of income and household disposable income at 75% of GDP.

Source: Authors' own calculations.

The pliability of the financial system can do a lot to help central banks make the most of compound interest rates to further increase household debt capacity. Fixed-rate 30-year mortgages have long been an American exception: just 20 years ago, in Europe and in Japan, the term of home loans was much shorter. Yet across the board, while rates were falling, the length of the loans offered by financial institutions continued to increase, serving to significantly boost the debt capacity of households. Here, again, the figures provide a clear example. If we retain the limit of 5.5% of disposable income for the household mortgage debt burden, their borrowing capacity barely exceeds 35% of GDP based on an interest rate of 2% for 10-year loans; if, however, a 2% rate is applied to 30-year loans, then borrowing capacity rises to more than 90% of GDP (Figure 24). Lastly, note that by slightly relaxing the aforementioned limit, we can increase this borrowing capacity much further: if we raise the limit to the total cost of debt servicing from 5.5% to 7% of household income, the aforementioned 90% jumps to 115%. This only requires – assuming no change in income distribution – that lenders and borrowers grow less cautious. In a world in which there is a shortage of borrowers, the pliability of the financial system can quite naturally lead to excessive risk-taking.

Unlike central banks, which use interest rates to prevent the economy from straying too far from its potential, private institutions in the financial system obey a market rationale. If they see a profit in giving out mortgages, they will definitely use the margins provided by monetary policy to their advantage. But, there are repercussions to stimulating the debt of some

households to offset the fact that others are accumulating claims or are paying back debts. In most cases, the homes bought by household borrowers will not be new builds and – provided borrowing terms remain favourable for some length of time – property prices will rise wherever supply is limited. This means at least some household borrowing will not go towards residential investments (expenditure benefiting companies that produce the goods and services needed for those investments[12]) and will instead generate profits for 'net sellers' of existing homes and building plots. There is a good chance they will save those profits. Of course, this is not the only unwanted side effect. The situation can also fuel the trend towards excess seen in chapter 3, which, if nothing is done to stop it, can culminate in a housing crisis.

A look back at the rise in US household mortgage debt

In the early 2000s, the United States exemplified the excesses caused by blind faith in the self-discipline of financial institutions. During this time, they devised products that expanded their borrower base by enabling households with a low credit score, few personal assets or insufficient income to buy a house. These institutions also allowed borrowers to 'extract' latent gain on real estate more easily by pledging their homes as collateral to obtain lines of credit. The continuous use of relatively low rates to counter the deflationary pressures at play (see chapter 3) led to a massive hike in household debt. For the most part, this stemmed from mortgages granted to the wealthiest Americans: between 1998 and 2006, the annual flow of mortgage borrowing by the top two quintiles (the 40% who earn the most) rose from 2% to 7% of GDP, an increase of 5%. Over the same period, for households in the bottom three quintiles, this flow grew by barely 1 percentage point, from 1% to 2% of GDP (Figure 25). The majority of stimulus therefore came from an increase in spending by the wealthiest households.

However, in doing away with the most basic safeguards (such as checking borrower income), the financial system let low-income households continue to borrow more, and in some cases even urged them to do so … When the financial crisis erupted, the mortgage debt of these households represented a much higher multiple of their income than for their wealthier counterparts. During the first part of the 2000s, these bad loans – reflecting the excesses to which a financial system is naturally

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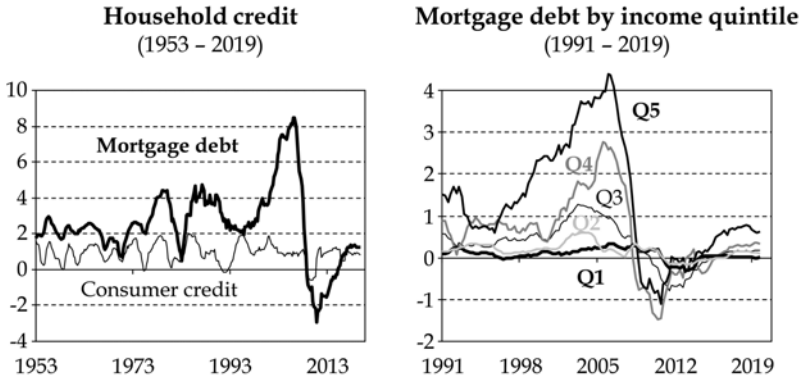
[12] In France, as in the United States, new builds represent just over 40% of residential investment. The latter also includes home renovations and property-related expenses (such as brokers' fees).

inclined when left to its own devices – only marginally buoyed activity; they nevertheless triggered a financial conflagration that did significant damage. Ten years later, the US financial system appears to have learned its lesson: despite the significant increase in mortgage lending tied to historically low interest rates during the pandemic, loans have only been given to households with the highest credit scores.

Figure 25. US household borrowing by type of loan and income quintile (as % of GDP)*



* These two graphs show the annual change in credit relative to GDP by type of loan (left) and (right) by household income quintile. Quintile 1 (Q1) corresponds to the 20% of households with the lowest income.

Source: Federal Reserve.

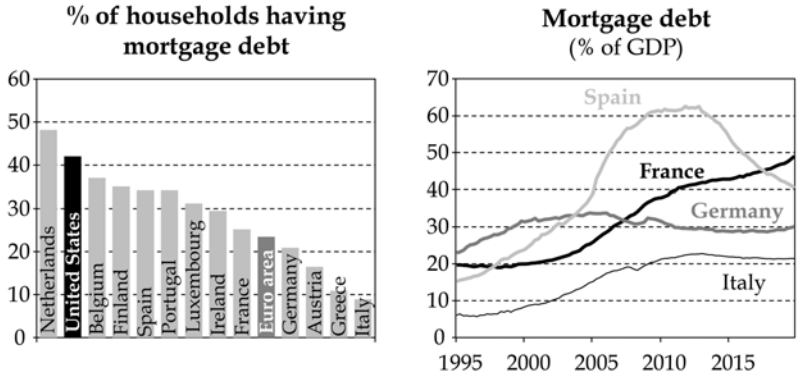
Contrasting change in mortgage debt in the euro area

Household credit has also served to stimulate activity well beyond the borders of the United States. Over the past few decades, the scope for household borrowing has been expanded around the world … and used. And across the board, the increase in households' overall debt has largely been the result of an increase in mortgage debt, with consumer loans taking a back seat. The mortgage debt of households in the euro area, which was close to 20% of GDP in the late 1990s, had jumped to 40% by the end of the global financial crisis, and has remained at that level ever since.

The situation has nonetheless evolved very differently from one country to the next in the region. At the end of the 2010s, fewer than one in ten Italian households had a mortgage, compared with an average of nearly one in four in the euro area and one in two in the Netherlands (Figure 26, left). In Italy and Germany, mortgage debt was quite low (a little over 20% and 30% of GDP, respectively) and has not climbed in those countries for many years since. The contrast with France is striking: after hovering at

nearly 20% of GDP in the 1990s, the mortgage debt of French households rose steadily to reach 50% of GDP by the end of 2019 (Figure 26, right). The change in the debt of Spanish households was even more abrupt: between 2001 and 2005, the drop in mortgage rates from 6.5% to 3% encouraged households whose nominal income was rising steadily – by 6.5% a year on average – to borrow; riding a wave of financial euphoria, their mortgage debt soared to more than 60% of GDP in 2009 … before falling back to 40% of GDP in 2019.

Figure 26. Household mortgage debt



Note: Data shown on the left are taken from the Household Finance and Consumption Survey published in March 2020 for the year 2017.

Sources: ECB, Refinitiv Datastream.

These diverging developments within the eurozone are a reminder that borrowing conditions – along with the state of banking systems (which affect the lending capacity of banks) and the legal and regulatory environment – differ greatly from one country to the next. For example, although the term of home loans has been lengthened, maturities are far from identical: in 2018, according to the European Mortgage Federation, the average maturity of new mortgages was 20 years in France, close to 25 years in Italy, Spain and Germany, 30 years in the Netherlands and 33 years in Portugal. All else being equal, this difference of 13 years between the length of loans to Portuguese and French households increases the borrowing capacity of the former by some 30% of GDP compared with the latter! At the same time, the longer maturity reduces the possibility of lengthening a mortgage further without the risk of borrowers making payments after retiring, when household income is normally lower. In July 2018, Portugal's central bank also capped the maturity for mortgages at 40 years, which will be lowered to 30 years in 2022. In France, in early 2021, the High Council for Financial Stability recommended that the maturity of

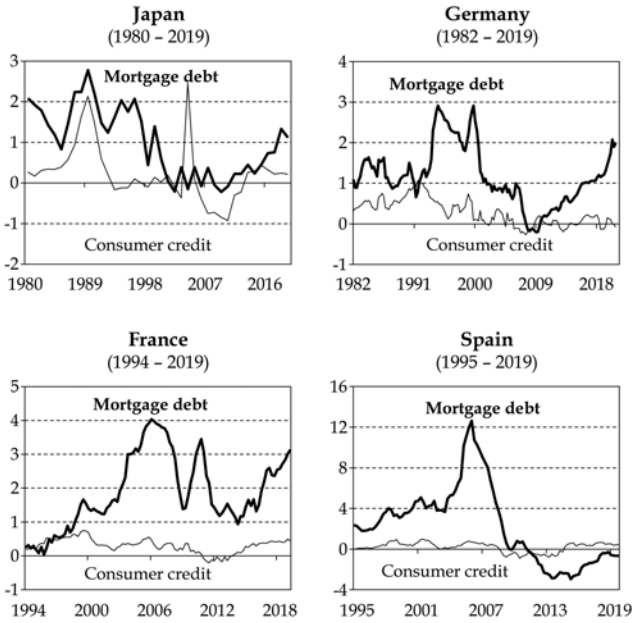
mortgages not exceed 25 years. Faced with the flexibility of financial systems, vigilant authorities could help ward off excesses – a safeguard all the more crucial given that the euro area may need to allow its households to maintain high mortgage debt for some time to come!

Lessons learned from Japan

Lessons learned from Japan over the past few decades are enlightening. Although household debt is now on a par with that seen in Europe relative to GDP, the developments leading to this parity have been very different. In the 1980s, a huge property bubble formed in Japan, inflated by both corporate debt and household debt. The financial liberalisation of the 1980s led Japanese banks to focus their loans on small businesses and property developers, who pushed up property prices by buying huge swathes of land (Brender & Pisani, 2001). When, in the early 1990s, the property bubble burst at the same time as a stock market bubble, households were the only private agent in a position to buoy the economy by borrowing to purchase homes. The drop in property prices – which in Japan are closely linked to the price of land – combined with the drop in interest rates to create a rapid surge in household debt: after climbing by 7% of GDP in the 1980s, their mortgage debt rose by 10% of GDP in the 1990s before levelling off at 35% of GDP until the middle of the 2000s.

One key consequence was that as long as there was high demand for debt investments from Japanese households, maintaining this level of mortgage debt was necessary to avoid aggravating the depressive effect of de-leveraging by businesses. However, ageing tends to lower mortgage debt as households strive to pay off what they owe before retiring. The policy of low rates and tax breaks helped counter this trend by allowing more households to invest in property at a younger age. The liberalisation of the mortgage market in the early 2000s and the use of government-backed securitisation provided by the Japan Housing Finance Agency created a new channel of financing, offering 35-year loans at a fixed rate, known as 'Flat 35'. The debt of households aged between 30 and 39 represented 50% of their income in 1980. This ratio rose to 100% in 2000 and nearly 200% in 2019 (Horioka & Niimi, 2019). Growth in debt among younger people, under 29 years of age, has been just as striking and swift in recent years. After representing nearly 65% of income in 2012, their debt had almost doubled five years later. In total, for the past two decades, mortgage debt has not fallen relative to GDP in Japan, but the age of borrowers has dropped.

Figure 27. Household borrowing (% of GDP)*



* For each country, the annual increase in each type of outstanding loans is shown relative to GDP.

Sources: National central banks, Refinitiv Datastream.

The challenge facing central banks, left to single-handedly maintain macroeconomic equilibrium, is now clear. Without a significant acceleration in growth, the net debt of companies is bound to remain low. Across the board, the impact of monetary policy will continue to be felt most keenly through the mortgage debt of households. For several years now, it has played a crucial role in maintaining full employment. The example of France is particularly striking: the average mortgage debt of French households has risen by more than 2% of GDP every year since 2000 (Figure 27). Yet, the margins created by this rise in household debt have continued to shrink. Almost everywhere, property prices have increased and maturities have been extended, with mortgage rates unable to drop much lower. Across the board, population ageing has tended to lower mortgage debt. This trend can only be countered by income distribution becoming more favourable to the less privileged segments of society. Still, there is little chance that household debt can single-handedly provide the necessary counterpart to an ever-growing pool of savings. As long as the demand for debt investments created by these savings remains strong, the intervention of a borrower of last resort will be needed to keep the economy at full employment.

6. THE LIMITS TO PUBLIC DEBT

When a country's private agents tend to hold more debt than they issue, macroeconomic equilibrium cannot be ensured without the intervention of an outside borrower. If the international environment is favourable and the country manages to have a sufficient current-account surplus, then the rest of the world can play that role. Over the past few decades, however, few developed countries have been able to find this kind of counterpart to match the demand for debt investments from their households. In nearly all cases, this counterpart has come through an increase in public debt. Faced with the dwindling effectiveness of monetary policy, governments have stepped in as the borrowers of last resort. Since the end of the 2000s, there has been an almost continuous increase in public debt. The pandemic that rocked the planet in 2020 only exacerbated the trend. Measures taken to stop the spread of Covid-19 suddenly forced households to save. The abrupt fall in consumer spending took income away from those who relied on this expenditure as a source of revenue. This gave rise to fears they would also be forced to reduce not just some, but all of their spending, which would in turn have stripped others of income, leading to even less expenditure … A deeply depressive spiral briefly loomed.

Governments quickly took steps to ward off disaster, providing financial aid to those who had been deprived of revenues as a result of pandemic-related restrictions. On the face of it, governments borrowed the savings of those who were unable to spend due to lockdown limitations and gave that money to those who had been deprived of their income by these limitations. In reality, this was another case of 'credit creates deposits'. Loans granted to the government by the banking system with the active support of the central bank enabled those who had kept their income but had been forced to cut back their spending to accumulate hundreds of billions in deposits. Without an increase in public debt, the economy would have contracted, driving down household income so as to rule out any accumulation of deposits.

The remarkable jump in public debt has rekindled debate about the limits to government borrowing. Conventional wisdom has undoubtedly been shaken by the fact that some governments previously seen as being on the verge of insolvency were suddenly able to come up with huge sums of money seemingly out of nowhere! Before exploring the limits to public debt, we will begin by clarifying the circumstances in which a government can and should step in as a borrower of last resort. In conclusion, we will emphasise a point the pandemic has made abundantly clear: since the government is also its country's insurer of last resort, the limits to its debt must be seen from a strategic standpoint. It must ensure that any efforts to curb its debt today do not force it to borrow even more tomorrow.

6.1 The government as a borrower of last resort

The government differs from private agents in two key ways: it is both 'eternal' and able to decide not just its total spending but also its total resources. Its debt gives private agents a unique means of transferring their purchasing power over time. In 19th century France, an individual could take out an annuity by a simple payment registered in the ledger of the public debt. While borrowing has been a government resource for centuries, it was not until the Great Depression of the 1930s that debt-fuelled public spending was used as a tool to maintain macroeconomic equilibrium.

The stabilising role of fiscal balance

In advanced economies, the sheer volume of public spending now makes it a significant stabilising force for the market economy. When activity slows – because companies borrow less to invest or because households choose to set aside more money – public spending is not affected, but the tax base shrinks and fiscal revenues dwindle, which increases the budget deficit. This gap will tend to widen because, in advanced economies at least, governments provide unemployment benefits that are financed by social contributions. The more economic activity slows, the more the government is forced to borrow to finance its spending. In so doing, it offsets a temporary shortage of private debt. These "automatic stabilisers" (OECD, 1999) combine with monetary policy to significantly mitigate swings in the business cycle. This of course leads to an increase in government indebtedness – an increase that is, at least in theory, fleeting: when private agents resume their usual spending patterns, activity picks up and both the tax base and social contributions grow again, without any acceleration in

public spending. As the economy expands, the weight of public debt falls more or less back to its earlier level.

Yet the outcome changes, when, despite the central bank's efforts to keep interest rates low, demand for debt investments still tends to exceed the issuance of private debt, preventing the economy from reaching full employment. Faced with this dearth of domestic debt, a country can, as we have seen, accumulate claims on the rest of the world by building a trade surplus. It can do that, for example, if it benefits from a particular specialisation in international trade that leads it to import products for which there is little growth in demand while exporting goods for which demand is particularly buoyant – a situation in which Germany and Japan found themselves during a few decades (Lafay, 1979). The same can occur if the country's prices, expressed in international currency, are lower than those of its competitors (China has long used the undervaluation of its currency to accumulate claims on the rest of the world). A country in which potential growth is weaker than that of its trade partners can also hope to build a trade surplus and use this to meet some of the demand for debt investments from its domestic agents. If this surplus is not sufficient – and even more so if the country has a trade deficit – then running a public deficit is the only way the government can maintain full employment. That deficit, far from being transitory like the one linked to the workings of automatic stabilisers, may then turn permanent.

This has been the situation in many advanced economies since the global financial crisis: the drop in central bank rates has not been sufficient to persuade private agents to take on enough debt to meet household demand for debt investments. Several central banks have even been forced to buy public and private securities on a huge scale, pushing a large part of the yield curve into negative territory. These negative rates clearly show an overall change in the intertemporal preferences of private agents. While positive interest rates reflect a preference for the present (borrowers are willing to pay to be able to spend now), rates that are close to zero or even negative in economies in which inflation remains positive reflect a preference for the future (lenders want to spend later and are willing to pay to transfer their purchasing power over time). Rates that remain low for a long time thus indicate a structural shortage of private borrowers. These long-term rates would of course be higher if the central bank did not buy debt securities, but if the rock-bottom rates created by this intervention are still not enough to boost private borrowing, then only public debt can prevent the economy from sliding too far away from full employment. As long as demand for debt investments from private agents outweighs their

debt issuance, any attempt to reduce the budget deficit and rein in public debt will only further curb activity.

The dangers of premature fiscal rebalancing

Japan, where 10-year government bond rates have been below 2% since the late 1990s, has for the past few decades served as an example of the consequences of reducing the budget deficit too early in an economy in which there is still relatively high demand for debt investments from households and in which companies are deleveraging. After an initial attempt at stimulus in 1995, fiscal policy tightened the following year, halting an incipient upturn in growth (Posen, 1998). This inopportune effort at fiscal adjustment was unsuccessfully repeated several times: growth did not take off, the public deficit remained high and Japan's debt burden continued to swell.

The European experience of the early 2010s is an even more striking example of what can happen when governments attempt to balance their budgets at the wrong time. In the wake of the global financial crisis, the world's biggest countries agreed to increase their spending and lower taxes in a bid to boost the economy. Eurozone countries quickly rallied to the international cause, ensuring the drought in lending to private agents did not paralyse the economy, albeit at a significant cost to their budget balances. EU member states then set out to quickly bring their deficits below the 3% of GDP set by the 1992 Maastricht Treaty, *irrespective of the level of deficit which they had just reached.* Unfortunately, in a deeply depressed global environment, asking countries that trade extensively with one another to swiftly reduce their public deficits even though the spending of private agents had still not recovered from the crisis could only lead to another recession (Brender et al., 2012).

The euro area has not entirely learned its lesson from this episode: capping public debt and deficits deprives European economies of a borrower of last resort. Admittedly, the safeguard clause enacted in 2020 made it possible to temporarily circumvent such restrictions. But once this clause is removed, they will in theory come into force again: deficits will need to be brought below 3%, and even lower when a country's debt strays beyond the 60% ceiling relative to GDP set by the Treaty. However, this ceiling no longer makes sense (Martin et al., 2021). Asking governments whose national debt now exceeds 100% of GDP to bring that burden down by more than 40% within 20 years means wagering that the private sector will at the same time be willing to reduce its stock of debt investments by the same amount (net of any debts it has issued). If that is

not the case, European growth will be paralysed by an over-restrictive fiscal policy. There is no reason to take such a risk.

6.2 What are the limits to public debt?

If a government keeps borrowing to prevent its economy from straying too far from full employment, will it not end up being unable to service its debt tomorrow? This particular concern was further fuelled by the explosion in public debt caused by the spread of the pandemic. Yet it is important to clarify the terms of this question. In advanced economies, the government borrows in its own currency. The central bank can therefore always 'print' the money needed to ensure the government does not run short of cash. There is of course a risk the government might urge the central bank to print 'too much' money, causing public and private spending to push the economy beyond its potential. This can trigger an inflationary spiral. The mechanism is always the same: when the banking system allows agents to 'overspend', either by lending to the government or to private agents, prices will rise. The only difference is that because the central bank is a public institution, the government can sway its policy. There is a real risk it could use this influence to impose its wants on monetary policy. The potentially devastating social and economic consequences of this sort of 'fiscal dominance' have been seen in the past.

The independence of central banks and the mandate given to them to ensure price stability are intended to avoid such dangers. So long as this independence is real, central-bank buying of government securities will not do away with limits on public borrowing. "Modern monetary theory" reminded us opportunely that maintaining macroeconomic equilibrium may require the central bank to help the government play the role of borrower of last resort (Wray, 2019). Even so, if the central bank is truly committed to keeping prices under control, it will only agree to help the government if public spending does not push the economy above its potential. At the end of the day, the ultimate limit to government debt is a 'real' limit. Yet it may differ from the one associated with the conventional approach to public debt 'sustainability'.

The sustainability of public debt

Unlike households, governments are not required to repay their debts. To be more precise, year after year, they can repay past debts by borrowing anew. Like all borrowers, however, they still need to pay interest to their creditors. They can of course do this by borrowing more but if the

borrowing goes on too long, debts will pile up and may spiral out of control. As the government's debt burden grows relative to GDP, private lenders will demand ever higher risk premiums, and may even refuse to purchase issued securities. To understand at what point this escalating spiral becomes a threat, we need to start with the relationship between the three variables that shape the debt-to-GDP ratio d over time: nominal economic growth g, the interest rate r paid on debt accumulated by the government (this *implicit* rate is not the rate at which the government is currently borrowing but the rate it pays on average for outstanding debt) and the primary budget surplus p relative to GDP, i.e. the difference between its income and expenditure *excluding interest payments.* Therefore:

$$D_t = (1 + r_t)D_{t-1} - P_t$$

where D_t is public debt at t and P_t is the primary balance at t.

Dividing the debt and the primary balance by GDP, we have:

$$d_t = \frac{1 + r_t}{1 + g_t} d_{t-1} - p_t \simeq (1 + r_t - g_t)d_{t-1} - p_t$$

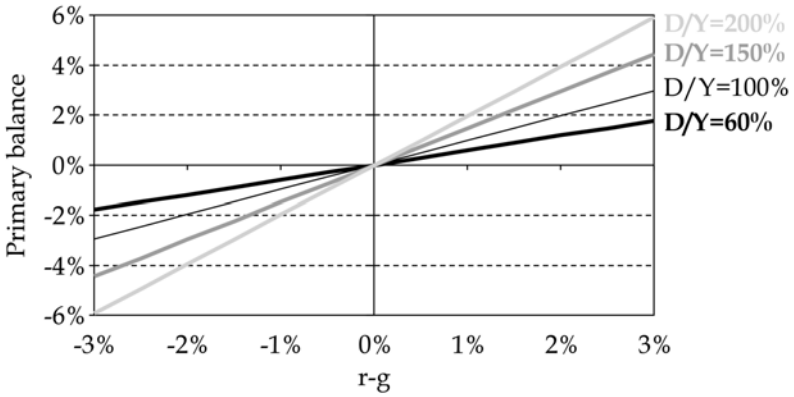
or:

$$d_t - d_{t-1} \simeq (r_t - g_t)d_{t-1} - p_t$$

The change in the debt burden will depend on the primary balance p and the difference between the interest rate r and nominal growth g. If the difference between r and g is positive (i.e. the cost of debt is greater than nominal growth), only a primary *surplus* can prevent the debt burden from increasing: the erosion of the debt-to-GDP ratio by nominal growth is not enough to offset the increase resulting from the borrowing needed to cover the interest expense. The bigger the debt pile, the higher this primary surplus needs to be (Figure 28). Allowing the debt burden to grow, by borrowing to service the interest, makes it increasingly difficult for the government to balance the budget and reverse the trend. Improving the primary balance p involves either raising taxes or reducing spending. But, if fiscal policy goes too far in that direction, it may encounter resistance from elected officials who vote on such measures (and even more resistance from the people they represent!). A government concerned with keeping its debt under control will therefore be reluctant to allow its debt burden to grow continuously. Clearly, the government does not need to repay its debt, but if stopping that debt from growing requires fiscal policy that is hard for the country to bear – which is what the IMF (2002) calls a "major correction" or,

worse, an "unrealistically large future correction" – then there is a good chance that things will only deteriorate.

Figure 28. Primary balance stabilising debt as a function of (r-g)

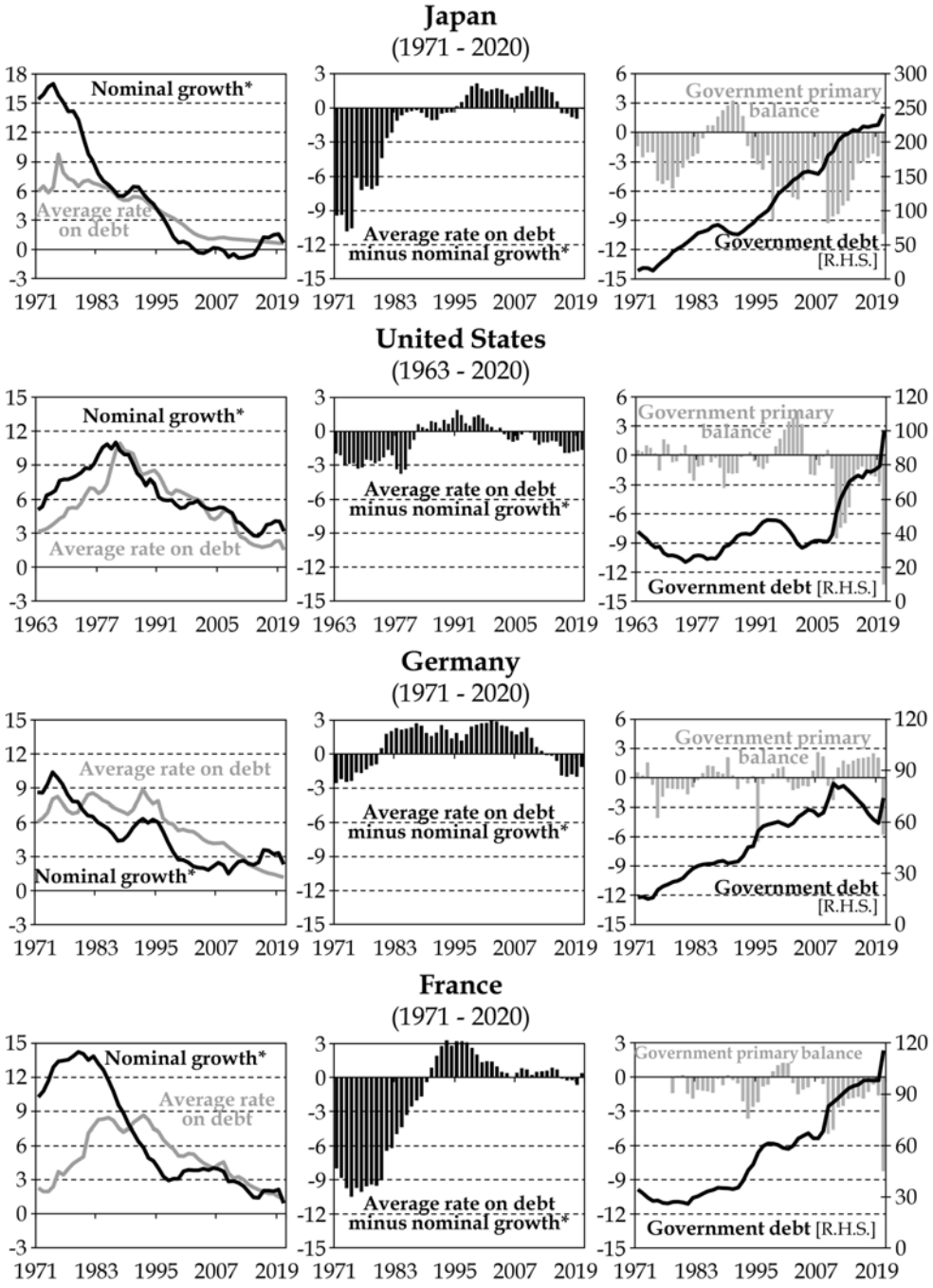


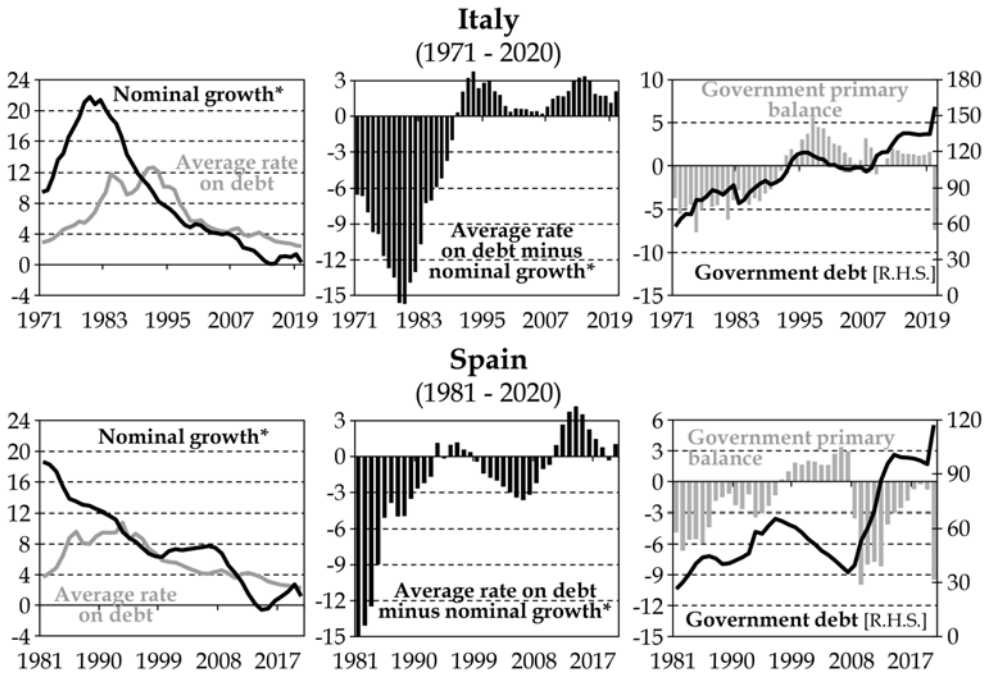
Note: The primary balance is expressed as a % of GDP (if it is positive, it is a primary surplus). For example, stabilising a debt burden representing 200% of GDP requires a primary surplus of 6% of GDP if *r* exceeds *g* by 3%.

Source: Authors' own calculations.

The outcome is different when *r-g* is negative (Blanchard, 2019). In this case, the public debt burden might not grow – and may even shrink – *even if there is a primary deficit and the government borrows to cover its interest expense:* nominal growth will this time reduce the debt burden faster than interest expense grows it. The greater the debt burden, the greater the impact. This situation was widespread in advanced economies in the 1970s, when unbridled inflation drove up nominal growth (Figure 29). In the United States, *r-g* has again been negative since the early 2000s, not because of inflation, but because of the relatively low rates maintained by a central bank focused on keeping the economy as close as possible to full employment. In Japan, *r-g* remained positive between the mid-1990s and the mid-2010s due to the slump in nominal growth. In the euro area, the situation has been less favourable than in the United States, especially for Southern countries in which government borrowing rates have for many years been subject to market pressures: *r-g* has been negative in Germany since the mid-2010s, virtually zero in France for the past two decades, and significantly positive for much of this period in Spain and even more so in Italy.

Figure 29. Interest rates, growth and public debt (%)





* Nominal growth is smoothed over seven years (the average length of an economic cycle). Figures for the United States are based on data provided by the Congressional Budget Office and concern only the federal government. Other countries reflect OECD data for all public bodies (i.e. the central government, the social security system and local authorities). Primary balance and public debt are expressed as a percentage of GDP.

Sources: Refinitiv Datastream, authors' own calculations.

The analysis of public debt sustainability by international bodies such as the IMF and the European Commission is based on the aforementioned relationship (Debrun et al., 2019). Debt is deemed sustainable if the risk that the government will be unable to prevent it from growing is low. To assess that risk, these bodies regularly simulate individual countries' trajectories of public debt for assorted time horizons, based on various assumptions for primary balances, debt costs and nominal growth. The sensitivity of results to the values retained for the different variables is high. For example, for a service cost of 4%, nominal growth of 2% and initial debt representing 100% of GDP, the debt burden will fall slightly over 30 years if the primary surplus is 2% but will rise to nearly 120% if the surplus is only 1.5%. A primary surplus that remains a little above or below the amount needed to stabilise debt can lead to very different trajectories. To allow for the uncertainty inherent in forecasts, the two bodies simulate several scenarios and test their sensitivity to assumptions for key variables. They also simulate debt ratios within a stochastic framework where these

assumptions vary randomly. Yet it is far from easy to use the findings of these simulations to guide fiscal policy: the limits to public indebtedness they reveal are relatively changeable (Box 10). In addition, the logic behind these exercises does not explicitly take into account the potential need for a borrower of last resort.

Box 10. The fuzziness of sustainable debt trajectories: two examples

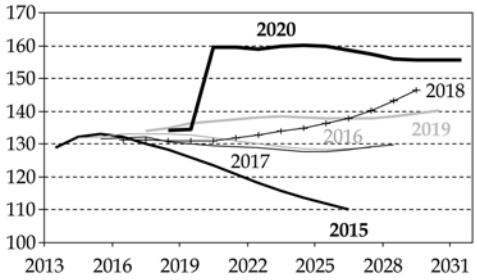
The contrasting findings of the simulations conducted in summer 2017 by the IMF and the European Commission on the sustainability of Greek debt illustrate the extent to which the chosen parameters can significantly affect debt trajectories. Based on similar primary surplus and growth assumptions, the IMF's baseline scenario projected a ballooning long-term debt ratio, while the majority of European Commission scenarios suggested the Greek public debt ratio would shrink! The underlying assumptions for interest rates played a crucial role in this surprising divergence. Alcidi and Gros (2018) showed how even small differences in the mechanism linking a government's risk premium to its level of indebtedness could lead to very different long-term debt dynamics (the IMF used a premium that increased by 4 basis points for every percentage point increase in debt to GDP above 60%, compared with just 3 basis points in the Commission simulations).

The revisions in the European Commission's debt-to-GDP trajectories for Italy between its 2015 report and its 2019 report also show the inherent uncertainty in such forecasting exercises. In 2015, the baseline scenario showed Italian debt to GDP would drop from 130% to 110% by 2026, assuming a primary surplus of just under 3%; three years later, the same simulation put debt at nearly 150% of GDP by 2029 (Figure 30). There was no change in r-g. However, the primary surplus of 2.6% of GDP had slipped to a deficit of 0.7%. In 2019, a downward revision of nearly 200 basis points in the implicit interest rate (with no significant change in assumptions for nominal growth) brought the debt-to-GDP ratio back to 140% by 2030, 10% below its level a year earlier.

Given the scale of the fiscal adjustment linked to the pandemic, the Commission had to revise its approach in 2020: instead of calculating trajectories using an unchanged primary balance, it assumed this balance would gradually return to pre-crisis levels. In addition, assumptions for interest rates were revised further downward (real rates converge at 2% in 2050 for all countries in the euro area, compared with 3% previously, which reduces Italy's cost of debt by around 0.3% in 2030). This is a small drop, but it enables a slight reduction in the debt-to-GDP ratio by the end of the decade. More importantly, it paves the way for an improvement in the long-term fiscal sustainability indicator (the S2 indicator), which would put Italy back in the 'medium risk' category in the long term (European Commission, 2020) rather

than the 'high risk' category, even though its debt will have grown by more than 15% of GDP by the forecast horizon!

Figure 30. Expected trajectories of Italian public debt, 2013-31 (% of GDP)



Source: European Commission.

The limit imposed by full employment

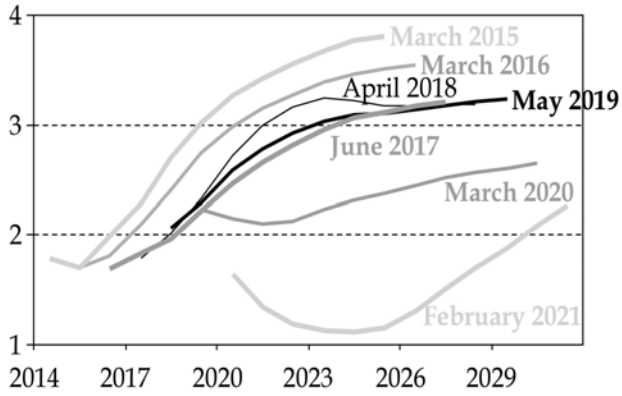
The 'hard' constraint on public debt in advanced economies is a real one: government borrowing, coupled with that of private agents, must make it possible to meet demand for debt investments when the country is at full employment … without exceeding that threshold. As long as demand for debt investments outpaces private debt issuance, public debt can increase relative to GDP without creating strain. This has been the case in Japan for the past few decades. Yet, that does not mean the government should be indifferent to its budget balance: it must be in a position to stop its debt pile from mounting and be able to reduce it if household demand for debt investments dwindles (and even more so if households dissave), especially if the indebtedness of private agents continues to grow. The government must then be able to reduce its budget deficit without having to implement 'unrealistic' policies. If it does not do so, a rise in prices will erode the purchasing power of spenders. By increasing interest rates, the central bank will strive to avoid the problem: it will use rates to curb the spending of some who were planning to borrow. One way or another, demand for goods and services will adjust to the potential output of the economy.

In its role as a borrower of last resort, the government should take cues from the indications monetary policy provides. It is the central bank's job to gauge how far the economy is from full employment. If a lack of private borrowers prevents the economy from reaching full employment, the central bank will lower its policy rates and possibly buy debt securities – particularly government bonds – in order to affect long-term interest rates. The implicit interest rate r on public debt will then gradually fall and the primary balance needed to offset the interest expense will be reduced.

With the cost of debt declining over time as debt is renewed, the impact of a lasting fall in bond yields is significant. This can be seen in the implicit interest rate projections for US federal debt found in the regular forecasts from the Congressional Budget Office: between 2015 and 2021, the projected rate for 2024 fell by 250 basis points (Figure 31). For debt representing 100% of GDP, the interest expense dropped by 2.5% of GDP and government spending capacity increased by the same amount. This gives the government scope to invest if it needs to do so. Clearly, its debt pile will grow, but the cost of debt will not necessarily grow as a result (Box 11). And if the investments it makes allow the economy to expand a little faster in the next few years, this will mitigate the increase in its debt ratio.

There is of course a risk rates will climb again in the future, which is usually the case when the economy nears its potential. The government will then need to reduce its deficit to keep debt under control, but it can do so gradually, since the increase in *r,* the average cost of its debt, will also be gradual: if the interest rate at which the federal government borrows suddenly jumps from 1% to 4% (a huge hike), the average interest rate the government pays to its lenders will only increase gradually, by around 0.5% a year.[13]

Figure 31. Projected implicit interest rate on US federal debt, 2014-31 (%)



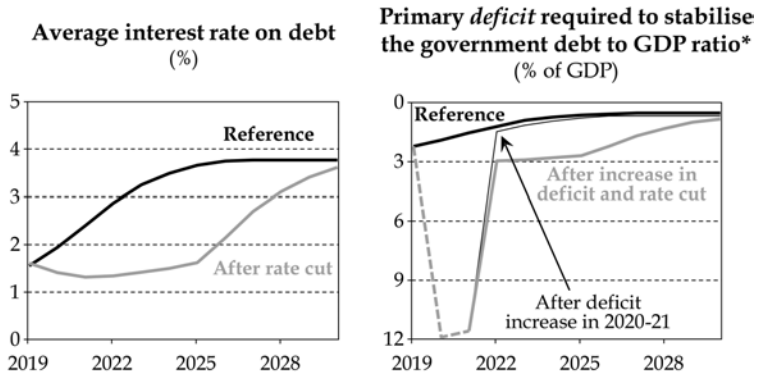
Source: Congressional Budget Office.

[13] Assuming an average maturity of six years and an increase of 300 basis points across the entire yield curve.

Box 11. Fiscal leeway created by a drop in rates: a numerical example

A simple calculation illustrates the window of opportunity for government borrowing created by a drop in the cost of government financing when a surge in savings occurs. Let us assume a stock of public debt equal to 80% of GDP for the period 2013-18 with a constant maturity of six years: the government refinances a sixth of its debt every year at a rate equal to the average for short-term rates and 10-year yields. We can then plot a baseline projection by taking short- and long-term rates between 2013 and 2018 to be those seen in the United States during this period, with short-term rates climbing to 3.25% in 2021 and long-term rates rising to 4.3% in 2022, a level close to that of nominal growth, which we will assume to be 4.5% for the period as a whole. Rates then level off. This allows us to calculate a baseline for the implicit interest rate *r*, which rises from 1.6% in 2019 to 3.8% in 2026, before levelling off (Figure 32, left). We can then calculate the reference path for the primary deficit *p* needed to keep the debt burden stable: assuming a primary deficit of 2.2% in 2019, the government must gradually reduce it to 0.6% in 2025 (Figure 32, right).

Figure 32. Interest-rate trajectories and resulting borrowing margins, 2019-30



* The primary deficit is expressed as a percentage of GDP.

Source: Authors' own calculations.

Now imagine an economic shock causes net demand for debt investments from the private sector to jump by 20% of GDP in two years. We assume this surplus demand will remain irrespective of the level of interest rates. The government is the only party to borrow to keep the economy on track: it increases its primary deficit by 10% of GDP in 2020 and in 2021. If interest rates stay the same, the primary balance needed to level off debt at 100% of GDP – which is 20% higher than its initial position – is virtually unchanged (Figure 32, right).

If, however, to accommodate the recessionary shock, the central bank lowers short-term rates and long-term rates for a few years, the government's cost of funding will temporarily fall: we assume *r* will remain close to 1.5% until 2025 then slowly climb, eventually reaching 3.8% in 2032. This change allows the government to maintain a primary deficit of nearly 3% for several years, before gradually reducing it as of 2025, when its average cost of debt rises. The scope for borrowing opened up by this drop in rates allows it to increase its *annual* investment by around 1% of GDP *for 10 years* while ensuring its debt burden is no higher at the start of the 2030s. The primary deficit needed to keep this ratio at 100% of GDP will then also be virtually unchanged.

The budget as a transmission channel for monetary policy

In order for the government to act as a borrower of last resort when needed, it has to have the right fiscal framework: the windows of opportunity created by low rates are conducive to introducing investment programmes that can be implemented quickly. As with any sort of fiscal spending, they must first be approved by parliamentary vote. An advance show of hands is therefore necessary to put in place programmes whose implementation will be 'contingent' (Furman & Summers, 2020). Just as important is the way in which the central bank pursues monetary policy. It does not need to give up the goal of stabilising prices or try to keep down the cost of public debt no matter what. It simply needs to continue – as long as the economy is not at full employment – to use the levers at its disposal to bring down bond yields. If the government can benefit from these low rates to boost spending by borrowing, its budget will become an alternative channel for the transmission of monetary policy (Panetta, 2021). That will thus enable the central bank to avoid going to increasing lengths to support economic activity: household debt, unlike corporate debt, is sensitive to monetary policy, but as we have seen, it is far from being boundless and its side effects can soon become a threat to financial stability. The consequences of any increase in public debt must be weighed against the repercussions of an ongoing accumulation of household debt and the bubbles caused by keeping interest rates too low for too long.

The past few years have revealed the innate failings of economic policy in the euro area: *maintaining full employment has not been set as a core goal for either fiscal or monetary policy.* In 2003, the central bank was forced to

redefine its goal for price stability – keeping inflation "below, *but close* to 2%"[14] – to justify the resoluteness with which it then sought to avoid any excessive drift away from full employment. Since 2012, this determination has led it to circumvent the Treaty's ban on buying government securities. As for fiscal rules, they have been established mainly with a view to ensuring other countries do not suffer the consequences of profligacy by one of their peers. This is a fair goal. However, many observers now advocate a revision of the rules drawn up to meet this goal (Blanchard et al., 2020). Still, asking the central bank to write off the public debts it is owed, as some have suggested, makes little sense. If the central bank manages bond yields to maintain macroeconomic equilibrium, the limit to public debt will continue to depend on the amount of debt households wish to hold at full employment: cancelling debts on the asset side of the central bank's balance sheet has no impact on this amount.

6.3 The government as an insurer of last resort

The need to intervene as a borrower of last resort when the central bank slashes rates to indicate that the borrowing of private agents is nearing its limits confers greater responsibility on the government. It can spend what it borrows to build a bridge to nowhere or have people dig holes and fill them in just to bring the economy towards full employment. But that would clearly not make the best use of the available savings! The government must instead invest in initiatives that have been approved by parliament and whose 'return' has been assessed. Physical and social infrastructure combined with careful regional planning, for instance, can improve living conditions while boosting business productivity. Strategic planning for fiscal spending – and revenues – is needed to make the best use of the savings provided by private agents.

Invest today to spend less tomorrow

In advanced economies, as the pandemic has shown, the government also serves as an insurer of last resort. This can entail future expenditure that the government will need to manage come what may, potentially by borrowing, as it has just done during the pandemic. As a result, it must continuously use the resources at its disposal – through taxation or

[14] In 2021, its latest strategic review has led the ECB to adopt a "symmetric 2% inflation target over the medium term".

borrowing – to reduce the expenditure to which it is exposed as an insurer. This includes investing to mitigate the risk of disasters that cannot be prevented. However, 'natural' disasters are far from being the only risk facing today's societies: international competition and technological advances, for instance, are forces that have a less visible impact but which can be even more damaging in the long run, with equally costly repercussions for the public purse. Anticipating the impact of these forces is crucial. Creating a more effective system of education and training to help future job seekers find better jobs, and more importantly to ensure they do not end up unemployed, is plainly a good investment for the government. Such measures boost growth potential, reduce the future burden of unemployment and social assistance, and increase the amount of taxes and contributions paid by employees and their employers. The same reasoning applies to combating the inequalities that erode social cohesion.

Growth in public debt requires us to look at all government spending from a strategic standpoint. Spending less – and often poorly – today to 'ease the burden on future generations' (at the risk of forcing these same generations to spend and borrow more tomorrow) can prove to be a terrible gamble. A 'farsighted parent' would prefer to bequeath assets that have been kept in good condition – possibly by taking out loans that heirs will need to repay – rather than leave behind a home on the verge of collapse because it has fallen into a state of disrepair. As we have seen, the government cannot expect to take on debt indefinitely. It is up to parliament to determine the extent to which spending will be financed by taxes or borrowing. Here again, it is important to take a long-term view. When the economy nears full employment, monetary policy will tighten and the government will pay more to borrow. It will naturally have some time to adjust its primary balance but adjustment will be needed nonetheless. Reining in debt while rates are still low by streamlining spending or using taxes will make this adjustment easier. Yet if the government does opt to raise taxes, it must also ensure levies do not lead taxpayers to spend less – a risk that is low if tax hikes target the wealthy, who are also those who save the most (Dynan et al., 2004), or companies whose earnings largely outstrip their capital investment needs.

The recent commitment of governments to tackle global warming is also a reflection of their need to prevent risks for which they are the insurers of last resort. As such, at least part of the investment in curbing greenhouse-gas emissions will need to be covered by national budgets. At the same time, unlike healthcare and education systems, the climate is a global public good. That means all countries can benefit from efforts made in this area, even if they have only played a minor role in contributing to improvements. That also means all countries will suffer if others do not pull their weight.

Consequently, helping less-developed countries to play their part is in everyone's interests, and might involve setting up new channels of financing to give them the necessary means. This would additionally reduce the need to call on national borrowers of last resort to meet demand for debt investments if it stays high on a global level. A supranational institution backed by a significant number of countries could issue long-term bonds to finance donations, loans and subsidies aimed at encouraging and helping the least developed countries to move forward in a 'greener' way. These debts would be serviced in part through international taxes, the proceeds of which would go to the issuing supranational body. Note that this sort of financing channel would simply transpose at the world level the measures the European Union has recently implemented through its Next Generation EU plan.

The problem of the euro area

The Next Generation EU plan is a bold financial innovation and a step towards greater fiscal solidarity between European governments. That said, it does not go far enough in enabling member states to fully play their part as borrowers and insurers of last resort. Unlike other advanced economies, these countries each have their own fiscal policies, but they share the same currency – and therefore the same monetary policy. For a number of years now, the European Central Bank has quietly done its utmost to keep the eurozone from straying too far from full employment. Even so, its main goal is to ensure the economy does not go above full employment – a job for which it is well equipped. Thus, it falls to fiscal policy to target full employment. As long as the euro area has no common budget or common debt, the fiscal policies of individual governments will need to ensure conditions are conducive to long-term full employment in their home countries. At the same time, member states must work with one another to manage their fiscal balances so as to allow all countries in the euro area to approach full employment … without going above that threshold as a bloc.

There is of course a constant risk that markets could drive up the cost of borrowing for an individual member state. This could happen if private financial institutions worry about a government's ability to keep its debt under control once the central bank has stopped buying bonds and has begun ramping up interest rates. Fearing exposure to such a risk in the future, some eurozone countries may then refrain from investing sufficiently even though interest rates are still low. The European Central Bank could protect them against this risk – as it did through its bond buying programme at the start of the pandemic – by providing 'unlimited' support to prevent a difference in risk premiums between member states

(Lane, 2020). However, the real problem would arise if market pressure on a government's debt securities was justified by that government's own careless fiscal policy.

Leaving it to face the music alone would certainly be one way to instil a tough lesson in fiscal discipline. Regrettably, experience has shown that such methods risk weakening the entire euro area. The other option, of course, is for the central bank to support that country no matter what. But again, this can lead to a huge moral hazard. Yet if eurozone governments wish to fully play their part as borrowers and insurers of last resort, it would seem they really have no choice. For want of a common fiscal policy, they must at least ensure their fiscal policies fit into some sort of common strategic framework. Within this framework, they also must agree to coordinate their fiscal policies (Sterdyniak, 2013). It is up to member states to demonstrate the responsibility, discipline and solidarity that implies. The very future of the euro is at stake.

CONCLUSION

The pandemic of the early 2020s was followed by a stunning change of attitude on the part of governments with regard to fiscal policy. On both sides of the Atlantic, governments that had previously been reluctant to increase expenditure opted to spend hundreds of billions to upgrade their economic infrastructure and tackle the climate emergency. Yet their debts had just surged by some 20% of GDP. In 2021, meeting at the G7 spring summit in Cornwall, leaders unanimously approved the idea that the big multinational corporations should pay their 'fair share' of taxes and growth should be more 'inclusive'. After years of using fiscal policy primarily to mitigate macroeconomic shocks, the governments of advanced countries now seem intent on once again wielding it as a tool to transform the economy, if not society.

If this turnaround transpires, it may come in the nick of time. Since the early 1980s, central banks have made huge strides in managing monetary policy. By one way or another adjusting credit distribution to demand for debt investments from private agents, they have succeeded in keeping economies close to their potential. In so doing, they have also seemingly disproved J.K. Galbraith, who, commenting on monetary policy in 1975, said "only the enemies of capitalism will hope that, in the future, this small, perverse and unpredictable lever will be a major instrument in economic management". Progress notwithstanding, monetary policy has nonetheless shown its limits for the past few years. The tools available to governments are much more powerful. Central banks' grip on economic activity mainly involves – as J.K. Galbraith made clear – influencing mortgage rates and, hence, borrowing. The side effects of such an approach cannot be overlooked. Governments meanwhile have a number of levers at their disposal, which they can also use in a number of ways.

Governments can employ fiscal policy to directly impact macroeconomic equilibrium. By levying taxes to draw on part of the income companies and the wealthiest households do not spend in order to transfer those funds to agents who are willing to spend, they can boost consumption. This will reduce the need to issue more and more debt and will ease the obligation to keep interest rates dangerously low. At the same time, redistribution will improve social equilibrium by reducing inequality. Governments can also stimulate and guide private productive investment. Plans to upgrade physical and social infrastructure will spur companies to

modernise, while the knock-on effects of public investment will encourage them to boost their production capacities. And yet governments can go even further in their ability to affect the allocation of savings: by providing a guarantee (or simply a label) for debt issued to fund private initiatives that promote the greater good, they can create new channels of financing. These will provide a means to funnel available savings towards target areas. All of this will ensure accumulated savings do not weigh on monetary policy and cause a steady increase in house prices, along with further financial frenzy.

It has taken decades for the central banks of advanced countries to learn how to wield interest rates effectively. It will also take time for governments to learn how to use fiscal policy to harness the power of accumulated savings to tackle the problems facing their countries. A strategic vision is not enough: the challenge lies in implementation, which means constantly ensuring expenditure and income are in line with the assigned targets. The sheer size of government budgets makes this difficult: it is not easy to spend both extensively and effectively. To avoid wasting the resources at their disposal, administrations will need to overcome the inertia of habit and natural resistance from vested interests. If they can do so, they will boost the credibility of fiscal policy, as has been the case for monetary policy. Provided governments pay attention to signals from their central banks and are able to improve their budget balance when the economy nears full employment, they will not go bankrupt.

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Debt continues to grow around the globe, regularly creating cause for concern. Are today's economies really nothing but a house of cards? The Covid pandemic has not helped matters: the debt of most Western governments has soared as a result. Will our governments go bankrupt, and who will foot the bill? While debt can be a catalyst for crisis, it is also crucial to economic growth, because one person's debt liability is another's debt claim. If nobody borrows, then nobody can set money aside. In a market economy, Aesop's fable does not hold true: the ants need the grasshoppers.

As long as households want to save more than private agents are willing to borrow, governments not only can, but should, continue to take on debt. They are not just 'borrowers of last resort', they are also 'insurers of last resort'. Faced with a future fraught with risks, borrowing gives governments a means of investing today to avert at least some of these risks and avoid taking on even more debt tomorrow. If they use their resources wisely, they will not go bankrupt.

This book tackles these issues in an original and thought-provoking way. By looking at the rise in debt from a macroeconomic and empirical viewpoint, the authors highlight the underlying forces while also pointing out the limits to public and private indebtedness.

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