

THE SOVEREIGN DEBT CRISIS

PLACING A CURB ON GROWTH

UPDATED EDITION

ANTON BRENDER

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AND

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FOREWORD

It is a great pleasure to present this update to the major 2012 study by Anton Brender, Florence Pisani and Emile Gagna on 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 second edition, Brender and his colleagues concentrate again on the tension between the need for the public sector to sustain demand in the face of a deleveraging private sector and the longer-term challenges of sustainability for fiscal policy in the major developed economies of the US, Japan and the euro area. In short, their principal thesis is that sovereign debt is in crisis. This crisis is apparent in the euro area, but it is also real, if at present only latent, in the US and Japan.

What is the nature of this crisis? For a number of years now, demand has been very weak throughout the developed countries. Private-sector demand has been weak because many agents found themselves over-indebted once the global credit cycle stopped and are thus trying to save. But as Brender et al. rightly emphasise at the global level, it is not possible for everybody to save more at the same time. This is why in many countries the public sector has stepped in and increased its expenditure. This book shows how this process has evolved in these three big developed economies - and how their policy choices impact on global financial markets.

Policy everywhere must thus find a way between the Scylla and Charybdis of insufficient stimulus for their weak economies and excessive issuance of public debt, which would endanger its risk-free status and thus deprive their economies of an indispensable benchmark.

How large is the passage between these two dangerous rocks? The book illustrates that as time passes and debt accumulates, the passage is getting tighter and tighter.

The book also shows that even in countries that appear to be in a comfortable position today (like Germany), the captains of the public finance ship will have to be very skilful as they are facing strong headwinds in the form of rapidly ageing populations.

This volume thus highlights a single overarching threat that runs through the difficult choices policy-makers face. The analysis does not provide an easy way out, but it is crucial in helping policy-makers recognise the dangers ahead.

Daniel Gros
Director of CEPS

INTRODUCTION

Sovereign bonds of all developed regions of the world were long regarded as safe investments. Those days are past. At the beginning of 2012, holders of Greek public securities were obliged to relinquish more than half the value of their claims. Furthermore, since mid-2010, the price of the debt of several eurozone countries has started to fluctuate wildly. These evolutions, regularly punctuated by announcements of downgrading by the rating agencies, are the manifestation of a broader crisis affecting other developed countries outside the eurozone.

In the autumn of 2008, the implosion of the western financial system, putting an end to the steady growth in private borrowing, made countries face up to the risk of a collapse in global demand. To prevent this, they accepted marked deteriorations in their budget balances and in so doing sowed the seeds of the sovereign debt crisis. To allow borrowing by governments to act as a substitute for borrowing by private agents, at a time when savings remained overabundant was nevertheless the right response. Public debt played its regulating role, absorbing the excess savings to prevent them from depressing activity (Chapter 1).

But governments must still be capable, when the time comes, of restoring the accumulated savings. This is where the real problem lies for the developed regions. With debt levels that are in many cases already high, with modest long-term growth prospects and with social budgets that are set to rise as a result of ageing populations, many countries cannot maintain a substantial budget deficit without seeing their creditworthiness called into question. However, stemming the rise in their debt too rapidly, by reducing public deficits at a time when private savings still tend to be excessive, would impose a dangerous curb on activity (Chapter 2). Faced with this dilemma, countries have adopted differing strategies. Japan and the United States have opted to give priority to a return to growth, whereas the eurozone countries have preferred a return to budgetary equilibrium.

The Japanese case clearly illustrates the risks involved in the former strategy (Chapter 3). Having already been confronted for more than 20 years with a situation of the kind now being experienced by many developed countries, Japan had then used fiscal policy to attempt to put its economy back on a growth path. It never succeeded. Since then, the public debt has grown constantly and at the beginning of 2013, Japan's budget balance was again the weakest of all the major economies. The radical changes announced by Prime Minister Shinzo Abe do not seem likely to alter this situation at all rapidly. True, as long as its debt remains the preferred outlet for its excess of private savings, Japan will be able to borrow at low rates. Starting in the middle of the current decade, however, with the disappearance of the excess savings by households, the government will be obliged to rebalance its budget. With little scope for a decline in spending, this can only be done through a drastic and lasting increase in tax pressure. If the government does not have the courage to propose this and if the Diet does not have the courage to accept it, the trap that has menaced Japan for the past 20 years will finally close.

The United States, for its part, is gambling on being able to avoid this trap (Chapter 4). Aware of the difficulty of kick-starting an economy in which the large overhang of private debt deprives monetary policy of much of its impact, the federal government has decided to maintain budgetary support until such time as growth has manifestly returned, even at the risk of seeing public debt increase in the meantime. In the shorter term, it has in fact some time to stabilise its debt burden, on the obvious condition that Congress has the will to do so. The main risk is that of persistently weak growth. If this were to be the case, the worries of those holding US Treasury paper, at least half of them outside the United States, would push down the dollar, with all the consequences this might have. However, even with growth back on track, another risk lies further ahead: in the absence of major reforms, the burden of social spending will increase and significantly impair budget equilibrium. The announcement at the earliest possible moment of such reforms of its social programmes is the best means for the American government to provide reassurance of its creditworthiness.

The path on which the eurozone countries have set out soon showed itself to be dangerous (Chapter 5). In the aftermath of the financial crisis, the fiscal situation of the eurozone as a whole was nevertheless better than that of the other major developed economies. Only for one of its members was the situation disastrous. Governments, seeking in vain to reconcile solidarity and the fight against moral hazard, then allowed a contagion

dynamic to develop which led them, one after another, to try to stabilise the burden of their public debt as rapidly as possible or even to reduce it. This dramatic episode has prompted the eurozone countries to clarify the conditions of their financial solidarity. Will this lead them to adopt joint management of their economic situations in a way that is more favourable to the return of growth? For this to happen, they have to accept the idea that budget discipline, albeit necessary, is not sufficient to ensure growth.

This change of attitude would be all the more opportune in that the consequences of the eurozone crisis extend far beyond the euro's frontiers. By calling into question the status of 'riskless asset' attributed to the sovereign debt of developed countries, this crisis is impairing the capacity for risk-taking – and hence also for intermediation – of the globalised financial system and imposing a reduction in international transfers of savings. In a world economy where it is "every man for himself", this constraint affecting current-account imbalances could easily jeopardise international currency stability (Chapter 6). We have by no means heard the last of the sovereign debt crisis.

1. PUBLIC DEBT, PRIVATE DEBTS

At the end of the first decade of the 2000s, many governments ran up substantial fiscal deficits in an attempt to ward off the threat of an economic depression. This response has sometimes been perceived as a policy of “borrowing one’s way out of debt”, which could only lead to an even more severe depression. Could one really hope to put the world economy back on a more assured growth path by adding an excess of public debt to an excess of private debts? This scepticism is at least partly based on a misunderstanding, however. Admittedly, the quasi-general rise in borrowing since the start of the decade is cause for concern. But it should not be overlooked that, in the developed economies at least, it is no longer private debt that is on the rise, but rather public debt. Contrary to a frequently held view, the risks related to a rise in sovereign debt cannot be analysed in the same terms as those related to the debt of a private individual. Sovereign debt differs from private debt both by its nature and by the constraints on its accumulation.

1.1 The particular nature of public debt

The notion that a government must not “live beyond its means” and that a build-up of public debt is bound to asphyxiate the economy has long been widely held. Was it not Adam Smith who predicted “the ruin [of] all the great nations of Europe” under the impact of the “enormous debts” each of them had accumulated? Ricardo, more pragmatically, advocated partial repudiation of the debt incurred by Great Britain during the Napoleonic Wars, notably to prevent “emigration to other countries in order to avoid the burden of taxation which it entailed” [Gordon, 1987]. And yet, as Macaulay [1871, p. 261] pointed out later in his *History of England*, “still the debt went on growing; and still bankruptcy and ruin were as remote as ever”. He went on to observe, “they erroneously imagined that there was an exact analogy between the case of an individual who is in debt to

another individual and the case of a society which is in debt to a part of itself". In the eyes of Schumpeter [1954, p. 310], the vision that had long predominated among economists according to which public finances have to be managed like those of a 'good family man', is explained by "the increasing influence of the bourgeois mind, which in fact had more reasons than one to dislike cavalier finance".

Herein in fact lies the first contrast between debt owed by the government and debt owed by a private individual: since the duration of the former is unlimited, the government can in fact *borrow year after year to repay the debts reaching maturity* without its being necessarily true that this 'cavalier finance' leads to catastrophe. If the size of the economy and interest rates remain unchanged, the debt burden transmitted from one generation to the next will remain the same. And if the economy is growing, the absolute amount of public debt can even rise without the burden on each generation increasing (on the sole condition that the growth rate of the debt does not exceed that of the economy).

A government levies taxes

A second difference lies in the respective underlying motives for borrowing. A government does not go into debt for the same reasons as a private agent. A household with insufficient income will borrow in order to bring forward in time a purchase that it would otherwise have been unable to make until it had gathered together the necessary savings. Borrowing enables it to anticipate future income: by drawing on this income, it will later be able to pay off the debt it has contracted. A firm that has not built up a sufficient financing margin will borrow in order to make an investment in the expectation of the additional income it will produce. This additional income will then enable it to repay its debt. However, at no time is either the household or the firm in a position to decide the amount of its income. For lack of the accumulated savings needed to finance one purchase or another today, it borrows, counting on future income to cover the repayment. If tomorrow the household's income is reduced as a result of job lay-offs, it may have difficulty in meeting its debt. The same will be true of the firm if the investment is ill-judged.

By contrast, the government is in the special position of being able, in normal circumstances at least, to decide more or less what its income will be, since its tax revenue will depend on its own decisions regarding tax rates. This means that it exercises control over its income in a way that private agents do not. Moreover, in principle at least, if it borrows in a

given year, this will be because its parliament decided to levy taxes for an amount smaller than its budgeted expenditure. What are the possible reasons for such a decision?

A first possible reason relates to the actual nature of this expenditure and especially to investment expenditure whose impact will be felt in much more than just the initial fiscal year. Part of this investment will be directly productive in the sense that it will increase the economy's market production potential and hence the potential for additional tax revenue at unchanged tax rates. In order to accelerate the implementation of the investment, the government – in the same way as a firm in this case – may decide to finance it through borrowing that will be repaid out of the expected 'return' in terms of tax revenue. Other types of public expenditure, without strictly falling into the category of productive investment, will nevertheless have effects that will benefit not only present taxpayers but also future taxpayers. By deciding to borrow in order to finance part of this expenditure, the government will be able to spread the burden between all the taxpayers concerned.

A second possible reason relates to the government's role in regulating the economy. Unlike a household or a firm, the government not only has its finances to look after, but it must also supervise the proper functioning of the economy and its fiscal policy can make a contribution in this respect. When certain private agents want to save more than others want to invest, overall demand slows down or even contracts and the risk of a recessionary spiral emerges. In order to try to ward off this risk, the government, for its part, can decide to spend more than it raises in revenue. It will then allow its revenue to grow more slowly than its expenditure, possibly by reducing tax rates. In this case, it will be borrowing, not to finance investment, but to underpin economic activity. Obviously, once the risk of recession has faded and the upturn in activity is assured, it will in principle implement the reverse policy, with its expenditure growing less rapidly than its revenue at a time when growth in the latter is accelerating, possibly following a rise in tax rates. In this way, the debt incurred can be reimbursed and the stabilisation policy will not add to the public debt. Things will be quite different, of course, if the economy is faced with a succession of shocks or if, once the upturn is well-entrenched, the government 'forgets' to generate the surplus needed to wipe out the debt previously incurred.

We now come to the final reason that could explain borrowing by a government, namely sheer passivity. Apart from the inter-temporal and

economic management reasons mentioned above, the government has no reason to borrow because in normal circumstances it only has to levy the taxes needed to avoid doing so. This obviously assumes that this is the objective of those who vote for the year's Finance Act and it is no secret that tax increases are rarely popular with voters! This means that the temptation to allow the public deficit to widen can be strong. Unfortunately, the resulting passivity can be encouraged by the third difference between public and private debt, namely that the government has its own special means of obtaining finance.

A government issues money

The government has a privilege that is not available to any 'good family man', namely that of issuing money. In this respect, it issues a form of debt that has the particularity of having 'legal tender status', i.e. of being acceptable in the settlement of any transaction, at least within its own sovereign domain. The government can therefore settle its debts with money issued by itself. Thanks to this, it is in principle protected against any default: in the last resort, it can always ask the public agency responsible for the money issue – the central bank – to provide it with the money needed to repay its maturing debt (or to subscribe to issues intended to provide it with the necessary liquidity). If, however, as has been seen in the past in a certain number of countries, it uses this privilege to maintain a budget deficit that leads to demand that is excessive in relation to the economy's productive capacity, the result will be a rise in prices. If nothing is then done to put an end to this 'monetisation' of the public debt, history shows that inflation will take on increasing proportions, with economic and social consequences that can rapidly become disastrous.

In most of the developed economies, the lessons of this experience have been learned and the central bank's primary mission nowadays is to implement policies aimed at ensuring price stability. For this purpose, the bank decides at regular intervals, in the light of the economic situation, the terms on which money is issued. The central bank's liabilities in fact define the quantity of money – in its narrowest sense ('base' money) – available to the economy. These liabilities include the currency used for the settlement of everyday transactions and the deposits made by banks with the central bank – the reserves – used for the settlement of interbank transactions.

The injections of money being made by central banks today are, in principle, decided *independently of considerations concerning the government's*

financing needs. Even so, the issue of money can to a certain extent facilitate the financing of a public deficit. This will be the case if the central bank is in the habit of issuing money (increasing its liabilities) through purchases of public securities. For example, the Federal Reserve systematically acquires a quantity of Treasury securities exactly equivalent to the amount of dollars in circulation. This demand for currency is determined by the settlement practices (and possibly the money hoarding practices) pertaining to the American monetary area. In all the economies where the issue of money is backed by public securities, the government can therefore borrow up to the amount of money issued by the central bank without having to convince any private agent to subscribe to its debt. Since the central bank's liabilities are not remunerated (in the case of the currency) or only to a small extent (in the case of the reserves), the government derives a financial advantage from this entitlement to 'print money', known as seigniorage.

One major exception is to be noted. The statutes of the European Central Bank prevent it, in principle, from acquiring debt securities issued by member countries. This means that the eurozone governments are deprived not only of access to a 'purchaser of last resort' of their debt, but also of the facility of obtaining financing linked to the issue of the cash balances needed for the normal functioning of the economy.

In order to fully appreciate the implications of this last point, it must nevertheless be noted that even if it does not purchase public securities, the ECB accepts them as collateral for the lending operations through which it meets the demand for liquidity (and that it returns to members the gain made by 'borrowing' at low cost the sums lent on this occasion). This 'eligibility' confers on public securities a particular attraction that normally affords them a special position, if not directly among the central bank's own assets, at least among those of the institutions that find their refinancing through the central bank.

In most developed countries, however, this privilege related to the issue of money plays only a relatively marginal role. The modernisation of means of payment has in fact considerably reduced the scale of the needs for central bank money. With the passage of time, the ratio to GDP of currency in circulation, in particular, has tended to decline. At the beginning of the 2010s, currency in circulation in the United States was equivalent to less than 7% of GDP, while in the eurozone it was 9%. By comparison, at the same date the ratio was still close to 15% in China. The demand for transaction balances - and also to a large extent the demand for precautionary balances - on the part of private agents have nevertheless

remained a source of structural demand for public debt securities. A large part, in fact, of these balances – money in the broad sense this time – is held in the form of deposits with commercial banks. Inasmuch as the banks are then the guarantors of their liquidity and integrity, they will do their best to manage the total mass of the risks they are taking, finding as the counterpart to the deposits investments that are relatively liquid and safe – such as public securities (or publicly-guaranteed securities). At the same time, at least until the introduction of Basel III, prudential rules – under which the credit-risk weighting of public debt securities of developed countries has been set at zero (meaning that they are considered as ‘non-risky’) – have, in Europe in particular, propelled them in this direction.

These securities, especially those issued by the largest developed countries, have therefore played a unique role in the functioning of the globalised financial system, namely that of a riskless asset. This particularity enabled them to benefit from constantly expanding demand from the banks, but also from the monetary authorities throughout the world seeking ‘risk-free’ assets. At the end of 2012, central banks’ foreign exchange reserves, largely invested in safe and liquid form, amounted to more than \$11,000 billion (roughly 30% of the outstanding debt securities issued by developed-country governments).

A government has enforcement powers

The security and liquidity of public debt securities provide governments with substantial margins for ‘painless’ borrowing. The public authorities have another ‘privilege’, however, that they can use in order to place their debt more easily. They can, through regulation, create demand for government securities that is this time of an ‘artificial’ nature. They can achieve this directly by requiring financial institutions to hold specified amounts of these securities. For example, until around the end of the 1960s, French banks were obliged to hold public securities equivalent to a minimum proportion of their deposits, this proportion being set by the Banque de France. A similar result can be obtained indirectly. For example, by limiting the remuneration on bank deposits in the United States, Regulation Q resulted, among other things, in a search for alternative investments that were liquid and safe but better remunerated. The result of this, too, was increased demand for public securities. These various regulatory constraints – often described as ‘financial repression’ [Reinhart & Sbrancia, 2011] – took numerous forms. To a great extent, they were brought to an end through the liberalisation seen in the 1980s, in the developed countries at least.

This 'repression', preventing the prices of public debt securities from being determined by the market and enabling the government to borrow at lower rates, can take a form that is not dictated by regulations but by interventions on the part of the central bank. These interventions may be linked to a willingness to help the government to find finance or simply, given the role of public securities in the functioning of the financial system, to a concern to maintain the system's stability.

For example, during the 1940s and until 1951, the Federal Reserve systematically intervened to stabilise the prices of public securities, with the result that throughout a whole decade interest rates on long-term Treasury bonds remained close to 2.5%. These interventions had initially been carried out in order to facilitate the financing of the war effort, and later in a concern for financial stability. In 1945, the commercial banks held a substantial portfolio of public securities, so that an abrupt rise in interest rates, by reducing the value of this portfolio, could have eroded their shareholder equity to a dangerous extent [Eichengreen & Garber, 1991]. Nevertheless, these interventions did not prevent the Federal Reserve from adopting throughout this whole period a monetary stance aimed at maintaining price stability. If at any given time it was obliged, in order to purchase public securities, to issue more money than necessary, it systematically 'froze' the surplus by increasing the compulsory reserve ratio. On the one hand, the money base – the central bank's liabilities – was increased, but on the other its velocity of circulation was reduced by the obligation to hold an increased proportion in reserves. This episode shows one of the advantages that a government can derive from a 'monetisation' of its debt, namely that it sets a ceiling on the yield on the bonds it issues. It also shows that, contrary to a widely held view, this monetisation does not necessarily imply the formation of inflationary pressures.

For such pressures to emerge, it is necessary that the financial repression be taken a step further and to assume not only that the central bank finances the government but also that it neglects, deliberately or unintentionally, its objective of price stability. In that event it will enable the money base to increase by more than is necessary, by keeping its policy rates low, at a time when the economic situation would require a tightening of monetary conditions. In this case, since its purchases of public debt prevent long-term rates from rising at a time when productive capacity is close to being fully employed, the necessary crowding-out of part of private demand can take place only through a rise in the price level. This inflation will be due, however, not to the 'monetisation' of the public debt itself but to an over-accommodating stance on the part of the central bank.

The same result could be obtained through over-generous financing of private debt and through keeping borrowing costs too low. If inflation does indeed increase, the government will see its debt burden ease over time, as will all those who have borrowed at fixed rates (provided, obviously, that their income rises along with inflation). In the decades following the Second World War, a significant portion of the declines in the American and British public debt-to-GDP ratios was explained by an acceleration in the price rise. However, everything suggests that this inflation was due more to errors in the conduct of monetary policy than to any deliberate concern to ease the burden of public debt [Buiter, 1985].

In most of the developed economies, central banks, now independent, pursue an objective of price stability. As a result, a budget deficit that takes total demand above the economy's productive capacity will lead to a rise in policy interest rates and, as a consequence, in the general level of interest rates. This latter rise, by reducing the private demand for loans – and hence also loan-financed final demand – will prevent the formation of inflationary pressures. If, however, the economy is not in a state of full employment, the government will be able to borrow without triggering any inflationary pressures. Its deficit – whether due to investment, the need to boost activity or simply neglect – will make it possible to absorb the excess private savings and prevent the level of activity from falling still further.

In an economy where the response of private spending to low interest rates is insufficient, public debt will therefore play the regulating role described earlier, functioning as a 'flywheel' capable of absorbing and stockpiling private savings when this is in surplus and restoring it when there is a deficit. In an economy where the private sector is chronically in a situation of excess savings, the accumulation of debt via this 'flywheel' can nevertheless pose a problem. That increases in public debt can be financed without a rise either in the interest rates at which the government can borrow or in inflation does not in fact mean that at some time in the future the government will not encounter problems in coping with its debt charges. The particular facilities enjoyed by the government in securing its finance are not without their dangers. Public borrowing may be painless today, but this does not mean that it may not turn out to be unsustainable tomorrow.

1.2 The limits on public debt

Unlike private agents, governments, as we have seen, are not obliged to repay their debts. To be more precise, they can, year after year, repay past

debt out of fresh borrowing, something that no private individual can do on a lasting basis. The only constraint that governments face is the need to pay the interest. Assessing the limits on public debt therefore amounts to assessing the government's future capacity to pay the debt service. A precise calculation of this capacity is not an easy matter, however, since it implies a fairly accurate projection of future public revenue and expenditure! In the absence of being able to define a limit on public debt on the basis of such a forecast, a more empirical attempt can be made, based in particular on past experience. Yet again, the fragility of the conclusions reached must be borne in mind.

The theoretical approach

The often-heard statement that every citizen 'inherits' at birth a debt of so many thousand euros or dollars is particularly misleading. In the first place, citizens in a developed economy 'inherit' not only a share of the public debt but also a share of the wide range of assets that the society has accumulated over the centuries. To talk of the inherited debt without simultaneously referring to this 'social capital' is fallacious: this capital largely determines future labour productivity and hence also the income accruing to tomorrow's taxpayers. It is this income and this debt that have to be weighed in the balance. Second, and most importantly, those who are born today will not be obliged to repay the public debt; they will in their turn pass it on to the next generation. They will be able to do this with a good conscience if, during their active lives, they have contributed, if not to developing, at least to maintaining, the social capital they inherited. As long as the economy continues to grow, each successive generation will be called upon to provide only the service on the debt - not the repayment of the public debt. Public debt will cease to be 'sustainable' only if it carries an interest burden that future generations are unable to cope with.

It is important to correctly assess the annual contribution made by citizens to a country's debt service. The figure corresponds to the difference between government revenue and total expenditure in the budget, *excluding interest*. This difference, known as the *primary* budget balance, measures the tax resources available to a government for transfer to its creditors in a given year. The amount of this transfer need not necessarily coincide with the total interest the government has in fact to pay in this same year. If its primary budget surplus is less than the interest due, the government will borrow in order to settle all or part of its debt service and its debt will increase. This will, *a fortiori*, be the case if its primary budget

balance shows a deficit, in which case it will be borrowing not only to pay its interest charges but also because its income is not sufficient to cover its other expenditures. The dynamics of public debt can therefore be seen to be crucially dependent on the annual primary balance. The debt will be stable if this is exactly equal to the interest due and it will decline if it exceeds this amount (in which case, part of the tax revenue will be used to wipe out past debt).

If one accepts the idea that a state, unlike a private individual, has an infinite lifespan, it then becomes a simple matter, in theory at least, to define the limit on its sustainable debt. If the interest rate at which it borrows is higher than the growth rate of nominal income and hence, one must assume, its budget revenue, it cannot expect to go on forever borrowing to pay its debt interest. If that were to be the case, its debt ratio would constantly increase and its creditors would at some stage finally refuse to continue lending to it. The limit on its sustainable debt is therefore set by the *maximum amount of resources that future taxpayers will be prepared to actually see transferred, year after year, to the government's creditors*. This limit is a function of the projection, over a time-horizon that may not be infinite but may nevertheless be long, of several variables (Box 1).

The first of these is obviously future tax revenue, which in turn will depend on growth in activity and in prices: the faster the growth in taxpayers' nominal income in future decades, the easier it will be to service the interest on the accumulated debt. If, on the other hand, the taxable income declines rather than increases, the payment of the interest will become more difficult, everything else remaining unchanged. Tax revenue will also depend on the rates set: increasing tax rates significantly, with no particular justification, could rapidly be seen as unacceptable by those who will be paying the taxes tomorrow.

However, the amount of future revenue is not the only variable one needs to project in order to calculate future primary balances. Projecting future government expenditure is just as important and this will depend on the government's current operating costs, on the entirety of the commitments it has made with respect to national solidarity and also on the investments that may be needed to permit improvements in the standard of living and welfare, or at least prevent them from declining. The faster the increase in this needed spending in future decades, the lower the limit on today's sustainable public debt – again, everything else remaining unchanged. One final variable should not be overlooked, namely the level of interest rates at which the government can borrow. It is in fact these

interest rates which, applied each year to the outstanding debt, will define the amount of interest that needs to be paid. Everything else remaining unchanged, the maximum amount of the government's sustainable debt will move in the opposite direction to that of the interest rates at which it can borrow tomorrow. This ceiling may even disappear if the rates are permanently lower than the nominal GDP growth rate.

Box 1. Assessing public debt sustainability

The equation for the accumulation of debt can be written simply as:

$$D_t = (1+i_t)D_{t-1} - P_t \quad (1)$$

where D_t is the debt at date t ; i_t is the average nominal interest rate paid on the debt in t ; P_t is the primary balance (i.e. the budget balance excluding interest payments) at date t (if this is positive, there is a primary surplus and the debt will be reduced by this amount).

The debt will be stable if the primary surplus is precisely equal to the interest paid (i.e. if $P_t = i_t D_{t-1}$).

Dividing equation (1) by GDP for the period t , it can be shown that:

$$d_t = \frac{1+i_t}{1+g_t} d_{t-1} - p_t$$

where g is the nominal GDP growth rate, p is the primary balance expressed as a proportion of GDP and d is the public debt/GDP ratio.

Noting that $\lambda_t = \frac{i_t - g_t}{1 + g_t}$, one then has:

$$d_t = (1 + \lambda_t) d_{t-1} - p_t \quad (2)$$

1. The ceiling on public debt

In order that debt should be, in the narrowest sense, sustainable, the principal and interest must be capable – at some date – of being repaid. Today's debt must therefore not exceed the net present value of the primary surpluses achieved by the budget in the future. Calling this ceiling D_s , we therefore have:

$$D_s = \sum_{t=1}^{\infty} \frac{P_t}{(1+i_t)^t}$$

If it is assumed, for the sake of simplicity, that λ_t is constant ($\lambda_t = \lambda$), one obtains:

$$d_s = \sum_{t=1}^{\infty} \frac{p_t}{(1+\lambda)^t}$$

In the favourable case in which $\lambda < 0$ (meaning that nominal growth is permanently higher than the interest rate) and provided that p is positive, the sustainability constraint is always satisfied and there is no limit to the government's sustainable debt.

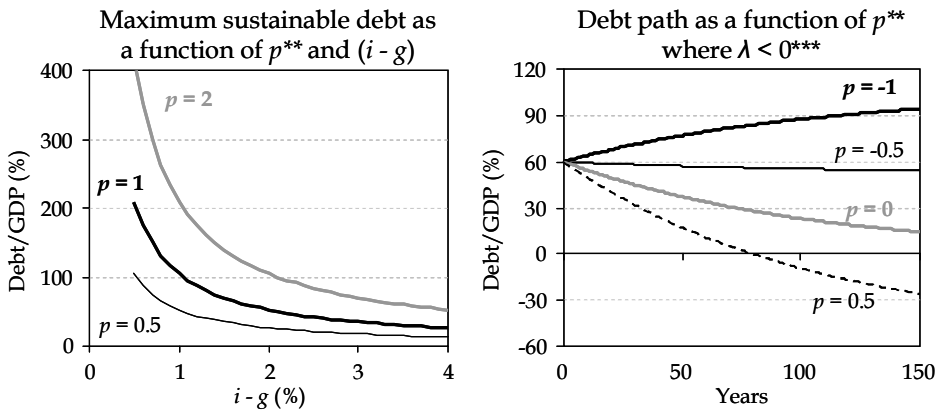
In the case in which $\lambda > 0$ and assuming p to be constant, the solution of the equation is:

$$d_s = \frac{p}{\lambda}$$

There is then a maximum limit on the sustainable debt ratio set by the maximum primary surplus p that the budget can generate *on a lasting basis*.

Figure 1 (left-hand side) shows, as a function of $(i-g)$, the sustainable debt levels for three values of p : the higher the interest rate in relation to the growth rate, the lower the sustainable debt level for a given value of p .

Figure 1. Evolution of the debt-to-GDP ratio



** The primary balance p is expressed as a % of GDP.

*** The values applied here are $g=5\%$ and $i=4\%$.

It can in fact be shown that when the intertemporal sustainability constraint is respected, the government cannot adopt a so-called 'cavalry' strategy, also known as a 'Ponzi game', involving indefinite borrowing not only to reimburse the capital but also to pay the interest due. In the long term, the net present value of its debt tends towards 0. The no-Ponzi condition can be written:

$$\lim_{N \rightarrow \infty} \frac{d_N}{(1 + \lambda)^N} = 0$$

Furthermore, from equation (2), the following relation can be deduced:

$$d_s = \frac{d_N}{(1 + \lambda)^N} + \sum_{t=1}^N \frac{p_t}{(1 + \lambda)^t}$$

Taking the limit of this equation when $N \rightarrow \infty$, it can immediately be seen that if the no-Ponzi condition is satisfied, then the sustainability constraint must be respected. Similarly, if the sustainability constraint is respected, then the government cannot implement a Ponzi game.

2. Primary balance needed to stabilise the debt ratio

Equation (2) also makes it possible to calculate the primary balance p_t needed to stabilise the debt-to-GDP ratio at its last achieved level (d_{t-1}):

$$p_t = \lambda_t d_{t-1} = \frac{i_t - g_t}{1 + g_t} d_{t-1}$$

If nominal growth is higher than the interest rate on the debt ($i_t - g_t < 0$), the government can run a primary deficit (equal to $\lambda_t d_{t-1}$ at most) and still see its debt ratio decline. This will be the case, *a fortiori*, if its primary balance is in equilibrium. Figure 1 (right-hand side) illustrates, for constant g and i , the evolution in the debt ratio as a function of the primary balance p when nominal growth exceeds by one point the average interest rate on the debt. In the case of a primary balance in equilibrium, the debt-to-GDP ratio declines over time.

If nominal growth is less than the interest rate ($i_t - g_t > 0$), a primary surplus equal to at least $\lambda_t d_{t-1}$ is needed to stabilise the debt ratio. If this cannot be immediately achieved, the debt ratio will continue to increase and, along with it, the primary balance needed for its stabilisation. Note, in this case, the instability of the debt paths. When $\lambda_t > 0$, a primary surplus only very slightly below or above the level required to stabilise the debt can lead, in the long term, to a very different evolution in the debt: with an initial debt ratio of 60% and with $\lambda = 1.9\%$ the debt ratio will tend towards 10% at the end of 150 years if the primary surplus is 1.2%, but will exceed 180% if the primary surplus is 1%!

Source: This box is based on Escolano [2010].

This theoretical approach has the advantage of placing the problem of the sustainability of public debt in the right context, which, for developed countries at least, is the long term. However, its operational virtues are, for precisely this reason, fairly limited. There will in fact be a strong temptation, when public debt increases to a worrying extent, to decide that it is nevertheless sustainable on the presumption that tax revenue will be increased in the near future or that there will be faster growth in activity or slower growth in public expenditure. In the final resort, it is obviously the government's creditors who will decide on the plausibility of the scenarios being envisaged. Experience has shown, however, that their judgement can

be dangerously imprecise. Complementing the theoretical approach by one that is more empirical therefore has its uses.

The empirical approach

For want of being able to calculate at all effectively the theoretical limit just defined, it is often considered that public debt is sustainable when it remains stable as a percentage of GDP. The reasoning here is directly derived from the previous one. If public debt remains stable as a percentage of GDP, this means that the debt increases at the same speed as taxpayers' income (GDP). If the growth rate and the interest rate remain unchanged, the government will be able to cope with its debt service by achieving a primary surplus representing an unchanged proportion of GDP. The assumption that is implicitly made in regarding this situation as sustainable is a simple one: if the transfer of resources from taxpayers to creditors corresponding to this primary surplus is bearable today, there is no reason why it should not be bearable tomorrow!

The limitations of this approach are obvious: it suggests that a given debt-to-GDP ratio can be sustainable regardless of its level, on the sole condition that it does not increase. However, if the net transfer – the primary surplus – that must be achieved in order to make the debt sustainable is substantial, it may be accepted for a brief period without necessarily being accepted indefinitely. Moreover, the risk of slipping onto an unsustainable path clearly increases with the size of the accumulated debt. If growth were to weaken in the future without interest rates falling by the same amount, it would be necessary, in order for the debt to remain sustainable, to increase the tax pressure or reduce the growth rate of public expenditure – the more so, the larger the size of the debt.

The same would be true if the rate at which the government borrows were to rise. There would then be a risk of an even more abrupt slippage in that these evolutions can rapidly come to interact in a 'vicious' fashion: if growth weakens, the primary surplus will shrink; if, in reaction, interest rates were then to rise, an even-greater increase in the primary surplus would become necessary and this in turn would threaten to curb growth even more, and so on. "When the debt ratio is high, the reaction of investors to negative news is likely to be highly nonlinear. Even relatively moderate economic, political, or debt shocks could prompt a fiscal crisis if investors think that the debt ratio may be about to cross the point of 'non-return'." [Escolano, 2010, p. 11].

Unfortunately, analysis of past attempts to determine the exact location of this 'point of no-return' beyond which a fiscal crisis becomes inevitable yields no clear-cut conclusions. Over the past two centuries there have admittedly been numerous situations of high public debt, but the ways in which they were resolved differed widely. As Spaventa [1987, p. 375] points out:

There are important cases of painless re-entry to a more normal situation mostly in Anglo-Saxon countries; cases in which the overhang of a high debt stock became a primary cause of financial instability, leading eventually to inflation, which in turn provided a drastic remedy to the original problem ... as in France in the 1920s; cases in which a high debt stock was one of many factors producing conditions of hyperinflation, as in Germany and other countries after the first world war; ... The one safe lesson one can draw from both facts and theory is that it is meaningless to look for a critical value of the ratio of debt to GDP beyond which the system breaks down and traumatic solutions become necessary: after all, the ratio was lower in France in the 1920s than in the United Kingdom between 1790 and 1840.

Recent studies have nevertheless attempted to approach the problem from a different standpoint. For want of being able to situate precisely the debt ceiling beyond which there is a serious chance that it will become unsustainable, these studies try to identify, still taking past experience as the starting point, the levels of public debt beyond which negative consequences for economic activity become clearly visible. This time the lessons to be learned seem to be more clear-cut. This is particularly true of the study by Reinhart & Rogoff [2010], published in the immediate aftermath of the financial crisis. Analysis of a sample covering 20 developed countries and the period 1946-2009 shows no significant link between debt levels and inflation, nor between debt and growth – *at least, in this latter case, when public debt does not exceed 90% of GDP*. When this ceiling is exceeded, however, the median growth rate is one percentage point lower than in the case of lower debt-to-GDP ratios. Other studies appearing at almost the same time, using more refined analysis, seem to confirm this critical value. Published at a time when the public debt of many western countries was rapidly approaching this 90% threshold, these studies caused a considerable stir and often led to the conclusion that it was essential to stabilise public debt levels as soon as possible or even to bring them substantially below this threshold when it had been exceeded.

It would be dangerous, however, to draw conclusions from these studies regarding the economic policy to be adopted in the face of the current evolution of public debt. In the first place, the mechanisms put forward to explain the link observed between high debt and growth are far from clear and, when they are, it is not obvious that their operation is necessarily unfavourable in the situation in which the western economies find themselves today. For example, the study by Checherita & Rother [2010], while highlighting an inverse relationship between public debt and growth, has difficulty in identifying the channels by which this mechanism would operate. In particular, the authors find a negative relationship between high public debt and the private savings ratio. If such a link were to come into operation in the very particular economic situation seen at the beginning of the 2010s, it would tend, not to curb growth, but, by reducing the private savings ratio, to ward off the risk of deflation hanging over the developed economies since the financial crisis! Moreover, these studies by no means dispel the uncertainty regarding the level beyond which there is a risk that public debt will become unsustainable. This threshold is a function of a wide set of variables, ranging for each country from its financial reputation to the quality of its institutions and obviously including, as we have seen, its economic growth prospects.

It is highly likely therefore that the limit will be significantly different from one country to another. What is sure in any case is that the evolution of the country's public debt has to be analysed over a longer period than the normal economic cycle. Its role, as we have seen, is to absorb the savings surplus that private agents tend to generate, especially at the bottom of the cycle, thereafter restoring it. Correctly assessing the storage capacity of the 'regulating flywheel' - consisting of the debt of the various governments - is of primordial importance. To what extent can the public debt of developed countries continue to be capable of absorbing the excess savings that the world economy will continue to generate in the coming years, possibly restoring it thereafter? Overestimating this capacity would inevitably lead to a succession of fiscal crises. But underestimating it would be tantamount to depriving the western economies of precious room for manoeuvre at a time when they are confronted with a particularly intractable economic crisis.

2. FROM ONE CRISIS TO ANOTHER

The recent increase in the size of the public debt in the developed countries is directly linked to the financial crisis of the late 2000s. In the period to 2007, progress with international financial integration had enabled private agents in a few western economies to absorb unheard-of amounts of savings generated in parts of the world economy where the spending propensity was relatively low. This meant that, despite the increasing share of these latter countries in world income, it was possible for activity to rise substantially everywhere. However, these transfers of savings were based mainly on a 'globalised' financial system that was fragile and inadequately supervised. Overburdened with risk and excessive lending, this system imploded in 2008. The almost instantaneous halt to credit growth, combined with the abrupt leap in the savings ratios of private agents whose growing spending propensity had previously been underpinning world demand, constituted a shock of unusual violence.

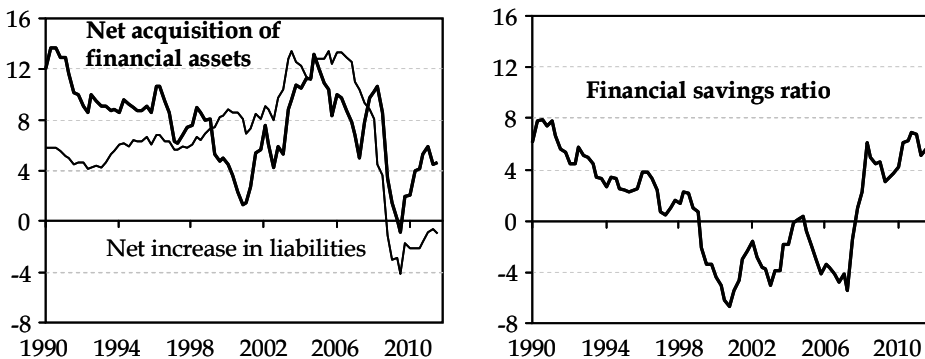
There was indeed no reason why the fact that these agents had ceased to borrow should induce a rise in spending on the part of those whose savings they had previously been absorbing. In order to avoid a collapse in world activity, governments therefore had little choice: from one end of the planet to the other they used their budgets to underpin global demand [De Grauwe, 2010]. The decline in spending propensities of the savings-importing regions was nevertheless so large that a deep recession in the western economies became inevitable: in most of them, with the notable exception of the United States, activity at the end of 2012 had still not regained its 2007 level! Since in most countries budgets had played their customary role of regulating 'flywheel' and absorbed the savings generated by the private sector, public debt rose substantially. Starting from a situation in which borrowing was already high in most western economies, this rise rapidly led to concern regarding the sustainability of the levels attained and to a general awareness of the need for better-balanced public finances. However, there is a danger that hasty imposition of a curb on

public borrowing, unaccompanied by a rise in spending propensities in regions that had until now always been exporters of savings, would lead to a gradual asphyxiation of world growth.

2.1 A deflationary shock of extreme violence

The expansion in the early 2000s of international transfers of savings tightened the links between the national circuits for spending and for income formation. These circuits were then abruptly and severely damaged by the crisis affecting globalised finance. The explosion of aversion to risk and the disorganisation of financial systems in fact led to the drying up of the credit flows which in many western economies were playing a central role in sustaining private spending. For example, net borrowing by American households, which at the beginning of 2007 was still equivalent to more than 10% of their disposable income, had become negative two years later, with net *repayments* exceeding 3% of their income (Figure 2). This turnaround was cushioned by a decline in their acquisition of financial assets. Households' propensity to spend their disposable income nevertheless fell by 10 points. Whereas prior to the crisis American households had been spending each year 5% *more* than their income, after the crisis they were spending 5% *less*.

Figure 2. Evolution of the financial savings of American households, 1990-2011
(% of disposable income, smoothed over one year)



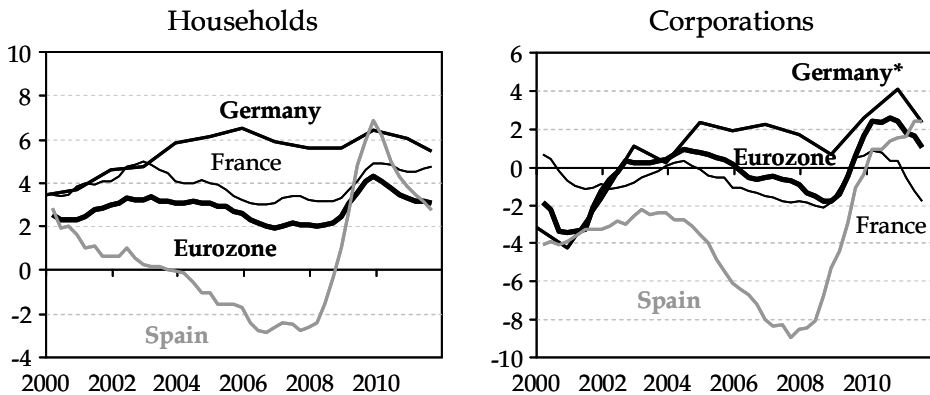
Source: Federal Reserve.

This radical change in behaviour compounded an equally dramatic change in the financial savings ratio (savings ratio minus investment ratio) of American firms: the uncertainty generated by the crisis, combined with the difficulty of borrowing, led them to curb their investment spending, so that

their financing requirement, which had amounted to just under 2 GDP points before the crisis, was replaced by a financing capacity of 6 GDP points. All in all, the spending propensity of American private agents collapsed, with their financing capacity rising in just a few quarters by roughly 13 GDP points.

In certain other economies, the shock was more violent still. In Spain, between 2007 and 2009, the household financial savings ratio rose by more than 9 GDP points and, with loans to real-estate promoters suddenly drying up, the corporate financing requirement fell in the space of two years by 9 GDP points (Figure 3). In total, Spanish private agents' spending propensity fell sharply and their financing capacity rose by as much as 18 GDP points! Granted, the evolution for the eurozone as a whole was not nearly as dramatic, with private agents' financing capacity rising on average by only around 6 GDP points. The explanation for this relative moderation is simple. The initial effect of the crisis was a decline in private borrowing flows and this decline was greatest in countries where these flows in previous years had risen most strongly: massive in the case of Spain and Ireland but non-existent in Germany, where private agents' net borrowing had shown no rise.

Figure 3. Evolution of private agents' financial savings in the eurozone, 2000-11
(% of GDP, smoothed over one year)



* Adjusted, in 2000, for the acquisition of UMTS licences.

Sources: ECB, Banco de España, Bundesbank and Banque de France.

The evolution in the spending propensity of private agents in the eurozone is therefore to be seen as an average, spanning countries where this propensity fell sharply after rising substantially until the crisis and

others where it had been stable before the crisis and remained so thereafter. The German case is not unique. Other countries that had been in substantial surplus before the crisis, such as China or Saudi Arabia, experienced similar evolutions: with their financial systems not directly affected, their private agents' spending propensities remained practically unchanged. Even so, these countries were not sheltered from the contractionary demand shock induced by the crisis.

The shock wave originating in the deficit economies then spread rapidly, helped by trade integration, to all their trading partners [Bussière et al., 2011]. Since the spending of one country contributes to income formation in others, the decline in the spending propensity of private agents in countries where borrowing had until then been underpinning world demand led to a decline in income in countries whose growth had been based on this demand. In this way, the shock affected more or less directly all countries participating in international trade.

The threat of a free fall in activity

The world economy then found itself facing deflationary pressures of unprecedented force. A simple calculation serves to indicate their size (see Box 2). For this purpose, the world economy is divided into two blocs: countries that had built up rising current-account deficits before the crisis, reflecting mainly a rise in private borrowing, and the rest. The spending and income formation behaviour in each of these two groups can be summed up, for the private agents, by their propensity to spend their disposable income and, for governments, by the ratio of public levies to GDP on the one hand and the volume of public spending on the other. Two market-share figures describe the trade between the two groups. The deficit zone accounted in 2007 for slightly more than half of world GDP and in the same year differed from the surplus zone in one essential respect, namely that its private agents had a propensity to spend their income that was in excess of unity (1.05), in contrast to the figure of less than unity (0.93) in the surplus zone. The impact of the shock related to the crisis can then be calculated by assuming that – *with everything else remaining equal* – the evolution between 2007 and 2009 in spending propensities in the first group of countries was the one actually observed. This amounted in fact to a fall from 1.05 to 0.89.

The result is spectacular: if nothing else had emerged to compensate for the collapse in the spending propensity of private agents in the deficit countries, nominal income would have slumped by 18% in these countries

and by 7% in the rest of the world. This calculation somewhat exaggerates the scale of the shock, inasmuch as a fall in activity to this extent could be expected to provoke a partially-compensating rise in private agents' spending propensities. It nevertheless reflects reality: following the shock, the world economy had in fact to find a new equilibrium, with private agents - *in both regions this time* - not spending all their income.

The only possible outcome of this new configuration of private spending propensities was a widening of public deficits on a sufficient scale to absorb the private savings. If, for the sake of simplicity, it is assumed that the *level* of government spending is fixed, the adjustment could only come from a decline in budget revenue, determined for the most part by tax *rates* (on income or on private spending). World income would therefore have had to decline to the point at which the induced fall in income produced public deficits equal to the savings generated, at this level of income, by private agents. If no other mechanism had come into play, world activity, and especially activity in the deficit economies, would therefore have been in free fall and government budgets would have found themselves in substantial deficit. In practice, a certain number of mechanisms and policies - fortunately - were on hand to cushion this shock. Public deficits indeed widened, but in a way that made it possible to avoid activity posting the huge drop that was threatening.

*Box 2. An evaluation of the scale of the 2007-09 recessionary shock**

In order to shed light on the effects of the 2007-09 shock, a simple framework can be used in which the world economy is divided into two regions. Region 1 comprises all the countries running a current-account deficit in 2007; region 2 consists of all the countries with a current-account surplus.

The formation of income in each region, it is assumed, can be written as follows:

$$\begin{aligned} Y_1 &= G_1 + (1 - m_1)D_1 + m_2D_2 \\ Y_2 &= G_2 + (1 - m_2)D_2 + m_1D_1 \end{aligned} \quad (1)$$

where Y_i is the income of region i ; D_i is the private spending of region i ; m_i is the proportion of private spending of region i that is met out of imports (the imports of one region being by definition equal to the exports of the other, m_2D_2 represents either the imports of region 2 or the exports of region 1); G_i is public spending in region i (its import content is assumed to be zero).

Let t_i be the average ratio of taxes to income of region i and δ_i be the spending propensity as a share of income of the private sector in region i . Private spending in region i can then be written:

$$D_i = \delta_i(1-t_i)Y_i \quad (2)$$

Using equations (1) and (2), the level of activity of region 1 can be written :

$$Y_1 = \frac{G_1 + m_2 D_2}{1 - \delta_1(1-t_1)(1-m_1)} \quad (3)$$

Similarly, the level of activity of region 2 is:

$$Y_2 = \frac{G_2 + m_1 D_1}{1 - \delta_2(1-t_2)(1-m_2)} \quad (3')$$

Using equations (2), (3) and (3'), one obtains:

$$Y_1 = \frac{(1-(1-m_2)(1-t_2)\delta_2)G_1 + m_2(1-t_2)\delta_2 G_2}{1-(1-m_2)(1-t_2)\delta_2 - (1-m_1)(1-t_1)\delta_1 + (1-m_1-m_2)(1-t_1)\delta_1(1-t_2)\delta_2}$$

and similarly:

$$Y_2 = \frac{(1-(1-m_1)(1-t_1)\delta_1)G_2 + m_1(1-t_1)\delta_1 G_1}{1-(1-m_1)(1-t_1)\delta_1 - (1-m_2)(1-t_2)\delta_2 + (1-m_1-m_2)(1-t_1)\delta_1(1-t_2)\delta_2}$$

The IMF's World Economic Outlook database makes it possible to calibrate the spending propensities and the tax ratios for the two regions in 2007 and in 2009. Region 1 accounted for 55% of the world economy in 2007. Between 2007 and 2009, the spending propensity of the region's private agents fell sharply from 1.05 to 0.89, whereas that of region 2 fell from 0.93 to 0.89.** This shock was cushioned in both regions by a decline in the tax ratios and a rise in public spending (Table 1).

Table 1. Simulations of the 2007-09 shock

	2007, observed		Simulated cases for 2009						2009, observed	
	Region 1	Region 2	(1) Decline in δ_1		(2) Decline in δ_1 and increase in G_1		(3) Decline in δ_1 and decline in t_1		Region 1	Region 2
δ_i : private-sector spending propensity	1.05	0.93	0.89		0.89		0.89		0.89	0.89
t_i : tax ratio (% of GDP)	35.8	34.7					24.7		33.8	33.5
G_i : public spending (billion dollars)	11 715	8 187			14 428				13 291	10 307
Y_i : nominal GDP (billion dollars)	30 892	24 788	25 350	23 054	30 892	23 939	30 892	24 788	30 396	27 334
Budget balance of region i (% of GDP)	-2.1	1.6	-10.4	-0.8	-10.9	0.5	-13.2	1.6	-9.9	-4.2
Current-account balance of region i (% of GDP)	-5.1	6.4	-3.6	3.9	-4.0	5.2	-5.1	6.4	-2.8	3.2

What would have happened if this had not been the case? Reasoning in a framework of partial equilibrium, the model provides an answer. In the absence of a modification in spending behaviour or in the revenue of the public sector (in other words, assuming no built-in stabilisers), the fall in the spending propensity of region 1 would have meant, everything else remaining equal, a contraction in the region's nominal activity of as much as 18%. For region 2, the consequences would also have been significant, with a fall in income of 7% (case 1).

In order to maintain activity at its 2007 level in region 1, it would have been necessary to increase public spending by as much as 23% (case 2). The shock for region 2 would then have been smaller. Since public spending has here no import content, this increase in spending in region 1 would nevertheless not have enabled region 2 to maintain its 2007 level of activity (its income falls by 3.5% in this simulation). Alternatively, one can calculate the decline in the tax ratio in region 1 that would have enabled activity to stabilise there: from around 36% to 25% (case 3)!

In reality, both regions adopted support measures. In all countries public spending was increased and the tax ratio reduced: between 2007 and 2009, despite the decline in private agents' spending propensity, the fiscal support measures almost made it possible to stabilise nominal income in region 1, while that of region 2 rose by 10%, a distinct slowdown, however, compared with the 24% rise seen between 2005 and 2007.

* The reasoning here is based on Aglietta et al. [1990].

** These propensities are not equal to those of the averages for each group of countries: private agents' financing capacity, being calculated by the difference between the bloc's current-account balance and its budget balance, is affected by various national and international statistical adjustments. The current-account balances of the two zones have been adjusted to achieve equality between current-account surpluses and deficits at world level.

Successful stabilisation

The developed economies in fact have at their disposal 'built-in' fiscal stabilisers whose role is precisely to prevent such a free fall in activity. When a recession starts to make itself felt, these stabilisers automatically come into play (such as allowances paid to laid-off workers, adding to public spending, or declines in effective rates of public levies, which are in most cases progressive). Their operation in 2008-09 helped to cushion the shock. Moreover, in the immediate aftermath of the crisis, governments aware of the risks for activity took deliberate fiscal support measures: stimulus packages in the form of tax cuts and increased spending were

rapidly set in place in a simultaneous, if not truly coordinated, attempt to prevent a new Great Depression. These efforts were often proportional to the shock that the country concerned directly faced so that, in general, the deterioration in the budget balance was greatest in countries where the decline in private agents' spending propensity was also greatest.

The authorities in the emerging economies (which account for a major portion of the surplus country group identified above) did not stay passive in the face of the shock originating in the developed economies. Unlike the latter, their financial systems had not been directly shaken by the crisis. By relaxing monetary policy, they could hope to stimulate the demand for credit and in this way raise the spending propensity of their private agents. Many countries made use of this instrument. In China, to take just one example, the distribution of lending to both private agents and local authorities exploded between 2007 and 2009, with a rise of roughly 4,000 billion yuan in 2007 and 2008, followed by one of more than 10,000 billion yuan in 2009, equivalent to roughly *30 GDP points*. These monetary policy measures were supplemented by massive fiscal stimuli. The built-in stabilisers available to the emerging economies being less powerful than those of the developed economies, the bulk of the fiscal support was provided through discretionary measures. In relation to the size of the economies concerned, the fiscal impulse provided – 3 GDP points over 2008-09 – was comparable to the average observed in the developed economies. This support made a major contribution to underpinning spending in the emerging regions and hence world spending as a whole.

These stabilisation efforts had their effect. Admittedly, they did not prevent growth from slowing down substantially and the western economies experienced their deepest recession since the Great Depression. However, this shock bore no relationship to the one that threatened. In the countries of the first group – those directly affected by the contraction of lending flows – the nominal level of activity fell only slightly (by 1.6%) between 2007 and 2009, while in the rest of the world it continued to make progress (+10%), albeit at only half the pace seen in previous years. This result has to be credited to the international cooperation efforts launched in Washington in the autumn of 2008, at the height of the crisis, in the G20 framework [Cabrillac & Jaillet, 2011]. This was at the cost of a sharp deterioration in fiscal equilibrium in the leading developed economies (as well as a surge in inflation in the emerging regions, linked in large part to a rise in commodity prices).

2.2 The need to restore fiscal equilibrium in the developed economies

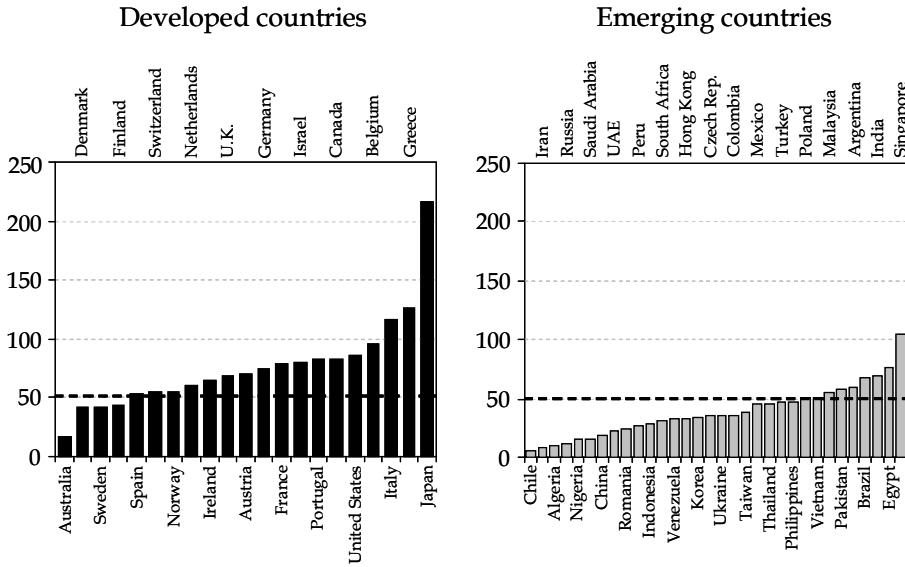
As shown in the previous chapter, it is in fact the public debt that makes it possible to absorb the savings surpluses that the private sector can generate in certain economic conditions. From this point of view, what happened from 2008 on was exemplary. The crisis in fact suddenly forced private agents to save a much larger proportion of their income. In response, governments increased their financing requirements and in this way a collapse in world activity was avoided. This widening of budget deficits nevertheless took place at a time when the slippage in public borrowing was already giving rise to concern – in many developed economies at least. Once the immediate emergency was over, however, governments made no attempt to agree on the manner in which the fiscal stimulus was to be withdrawn. Instead of drawing up, within the cooperation framework that had just been introduced, coordinated ‘exit strategies’, each of them rapidly began acting independently again and defining its fiscal policy in the light of its own priorities: underpinning growth in some cases, restoring fiscal equilibrium in others. Given this disunity and given also the resulting weakening of the recovery, developed-country governments’ capacity for keeping their borrowing under control was called into doubt for the first time since the Second World War.

The developed economies dangerously placed

It should come as no surprise that these doubts were concentrated on the developed economies. Over the preceding decades, most of them had built up substantial levels of public debt. Few of them in 2009 had public debt-to-GDP levels of less than 50% and in some cases the level exceeded 100%. In the emerging regions, or at least in the largest countries, the situation was precisely the reverse: for most of them, the public debt-to-GDP ratios were substantially below 50% (Figure 4).

Developed and emerging regions also differ in terms of their inflation and growth prospects. A slowdown in labour force growth, combined with slower productivity gains, is in fact a feature common to almost all the developed countries but not one that is shared by the emerging countries. Even those where the demographic tendencies are set to become less dynamic, such as China in particular, still have sufficient potential for productivity gains to fuel growth. And, as was shown in the previous chapter, growth in future decades is a determining factor for the sustainability of public debt.

Figure 4. Public debt in developed and emerging countries in 2009 (% of GDP)



Source: IMF.

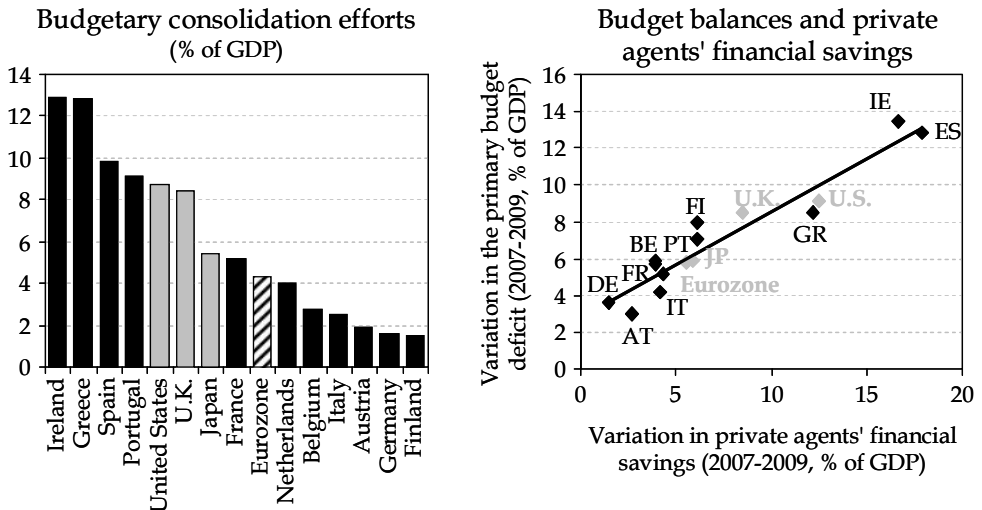
With relatively high public borrowing and with poor prospects for growth in nominal income, the developed regions in the aftermath of the crisis are therefore clearly less well-placed than the emerging countries to confront the deterioration in their public finances – especially as their future capacity for generating the primary surpluses which, along with growth, are essential for them to be able to service their debt, is being impaired by commitments that are largely absent in the emerging economies. Many developed countries in fact have social welfare systems that are imposing, over a fairly long time-horizon, substantial budget spending increases simply because of the ageing of the population and the rise in healthcare costs. These commitments set a floor on the possible compression of budget spending. At the same time, the level of taxes and social contributions is already high and this sets another limit, this time on their capacity to increase revenue further. The room for manoeuvre available in the aftermath of the crisis to many developed countries for managing the evolution in their public finances is therefore much more restricted than that of the emerging regions.

In the summer of 2009, when the first signs of stabilisation of activity started to appear, governments in the developed countries were everywhere confronted with the same problem. Regardless of the desired level of their public borrowing, their first priority was to stem the increase

and hence to decide how fast and in what manner fiscal stimulus would give way to fiscal tightening. Clearly, the size of the improvement needed in the primary balance to achieve stabilisation of public debt differed from one country to another.

Simple arithmetic indicates that this effort must be greater, the greater the deterioration in the primary balance but also the higher the existing burden of public borrowing and the wider the expected difference between the rate at which the accumulated debt is remunerated and the future growth rate (Box 1). Figure 5 (left-hand side) gives a measure of the efforts required from the United States, Japan, the United Kingdom and the various eurozone members, depending on the state of public finances for each country and its growth and financing prospects at the end of 2009. The scale of the effort required from each of the economies is explained mainly by its 2009 primary balance, with the burden of the accumulated debt and the difference between the interest rate and the growth rate playing in most cases only a marginal role. The link mentioned earlier between the financial crisis and disequilibria in the public finances then takes on greater clarity. *For the most part, the deterioration in primary balances seen in each country between 2007 and 2009 was proportional to, albeit of lower intensity than, the increase in their private agents' saving propensities* (Figure 5, right-hand side).

Figure 5. Comparison of deficits and required budgetary consolidation efforts



* Reduction in the primary budget deficit over the period 2010-15 needed, at the end of 2009, to stabilise the debt-to-GDP ratio in 2015.

Sources: IMF, OECD and authors' own calculations.

Uncoordinated exit strategies

The situation of countries where the fiscal consolidation needed is greatest takes on an even more worrying aspect in that the concern not to depress activity still further would normally dissuade them from reducing too rapidly the deficits that had emerged. Such a widening of deficits was needed to avoid a slump in activity in response to the abrupt fall in private agents' spending propensities. Attempting to eliminate the deficits to which this response had led *before* these propensities had started to rise again would induce a further fall in activity and hence a further deterioration in the public deficits [Wolf, 2010]. In order for growth in the developed countries, and especially in those running a current-account deficit, to have a chance of reviving, it is necessary to maintain substantial public deficits *over a certain period* and hence accept a significant rise in public debt.

The consequences, it should be noted, are not necessarily dramatic. Adding 15 or even 20 GDP points to the public debt implies only a very marginal modification in the improvement in the primary balance needed in order later to stabilise the burden (although an additional effort will obviously be required to cancel out this rise in debt). In addition, the evolution in the rates at which governments can borrow following the crisis has been extremely favourable. Sovereign debt of western countries has for many decades taken on the particularity of being considered 'riskless' and acting as a safe haven in times of crisis. Government borrowing rates have a tendency to decline in times of economic slowdown and the late 2000s were no exception in this respect. The decline in government borrowing costs has served to cushion the rise in interest charges related to the upsurge in debt and hence to reduce the effort needed subsequently to stem the upsurge.

Confronted with the same problem, the developed economies do not, for all that, share the same analysis of the dangers related to the evolution in public borrowing. For some, the fact of allowing public debt to exceed a given *absolute percentage* of GDP – 90%, or even 60% – is in itself cause for concern and stemming the upsurge in government borrowing becomes a priority. For others, this upsurge has to be accepted until the upturn in activity is assured. Germany, which in June 2009 wrote a 'debt brake' clause into its constitution, clearly falls into the first category, as does the United Kingdom, where the Conservative-led coalition government introduced an austerity budget shortly after its election. Equally clearly, Japan and the United States fall into the second category, having decided to

maintain huge public deficits. This lack of coordination of exit strategies can only be weakening the upturn in the world economy. It would have been logical that the countries with the shortest road to travel in order to stabilise their debt ratios would not be the first to set out on it. And yet this is what happened. It was the countries of the eurozone whose situations showed, on average, the smallest deterioration that launched all-out drives to reduce their budget deficits. Admittedly, these countries had been the first to come under pressure from the markets. Because of a failure to set out clearly the modalities of their solidarity, the solvency of those whose financial equilibria seemed the most fragile was called into question.

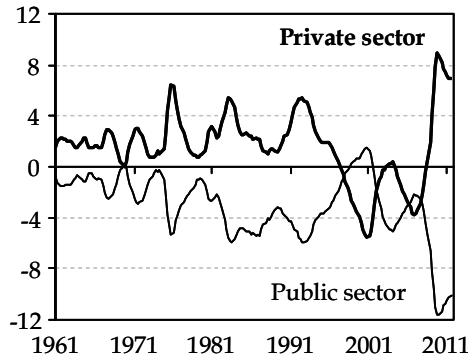
Having cooperated in the introduction of the fiscal stimulus that prevented a collapse of the world economy, the developed countries from 2010 on drew up their exit strategies in a spirit of “every man for himself”. And yet, in September 2009, at the Pittsburgh G20 Summit, a “Framework for Strong, Sustainable and Balanced Growth” had been sketched out. Individual national problems and priorities resulted, however, in this framework remaining no more than a sketch. This absence of international coordination is all the more disquieting in that the reduction in public deficits launched in all countries will for several years have major consequences for the equilibrium between savings and investment at world level. The drawing up of exit strategies in the G20 framework and their articulation with the policies implemented to stimulate spending in the emerging economies could have considerably reduced the risk of seeing at some future date an excess of savings asphyxiating world growth.

2.3 Dangerous implications for world growth

Since the end of the 2000s, public deficits, and especially those of the western countries, have been absorbing much of the world economy’s surplus savings. What impact will a reduction in these deficits have over the coming years? This will depend on the evolution in the spending propensities of other agents and, in the first place, those of private agents in countries where these efforts are going to be made. If, at a time when their government is borrowing less, private agents are saving less, the country’s overall savings will remain unchanged and putting public borrowing back on a sustainable path will generate no macroeconomic tension. Note that this would correspond to a ‘Ricardian’ adjustment in private spending: with public finances improving, private agents expect to have to pay less taxes in the future and so spend more today (Box 3). Their financing capacity then fluctuates in phase with the public deficits. During the

decades preceding the 2007-09 crisis, there would seem indeed to have been synchronisation of this kind, for example in the case of the American economy (Figure 6).

Figure 6. Evolution in the financial savings of the private and public sectors in the US, 1961-2011 (% of GDP, smoothed over one year)



Source: Thomson Datastream.

This conclusion can be deceptive, however. An evolution in private saving, that is in phase with that of public deficits can be explained just as easily by the cyclical character of both variables. In an economy where economic regulation has been implemented largely through monetary policy and where fiscal impulses (the measures taken explicitly to boost or to curb activity) have been significant only for brief periods – as was the case in the United States for several decades – it is something of a tautology to see a close relationship between public deficits and private savings surpluses. Phases of slowdown in activity are triggered by a rise in interest rates that reduces private agents' spending propensity and so leads to a slowdown in activity and a deterioration in the budget balance. Conversely, activity is stimulated by a fall in rates, which by increasing private agents' spending propensities, stimulates activity and allows the budget balance to improve. Noting that, in this case, reduction of public deficits and a rise in private agents' spending propensity go hand in hand in this manner tells us nothing about the way in which these two variables are set to behave in the coming years.

A non-Ricardian world

The situation of the western economies in the early part of the 2010s – and that of the United States, in particular – is in fact very different from that

seen in earlier decades. These economies are going to be subjected to a negative fiscal impulse *at a time when monetary policy has lost most of its power to stimulate* [Blanchard & Milesi-Ferretti, 2011]. There is then good reason for private agents' spending behaviour not to be Ricardian. In the first place, it should be noted that central banks' policy rates have already reached their lower limit at a time when private agents' spending propensities are also exceptionally low. In these circumstances, a cut in interest rates cannot be used to stimulate private spending. Second, the crisis has intensified a tendency that has been present since the early 2000s in developed countries, namely that the corporate financing requirement has continually declined and even turned into a significant financing capacity. Taken together, firms are now net lenders, not net borrowers, and are likely to remain so as long as the weak growth prospects prompt them not to invest more!

An increase in the spending propensities of private agents in the developed countries therefore implies, in most cases, an upturn in household borrowing. This upturn will be all the slower in that the banking systems of the developed countries are far from having recovered from the shocks to which they have been subjected. The conclusion is straightforward: a possible increase in private agents' spending propensity will for some years to come be subjected to severe constraints. Such a rise is therefore unlikely to compensate for the reduction in public deficits needed to stabilise debt-to-GDP ratios, especially if the reduction were to be relatively fast.

A recent study by Guajardo et al. [2011] comes to a similar conclusion, based on an analysis of the past. This study starts by identifying, for all countries for which the necessary data are available, the episodes during which *explicit efforts* at fiscal consolidation were implemented (those in which, along the lines of what will be seen in many developed countries, the budget has been a lasting source of negative impulse for activity). This means that episodes in which a cyclically-related improvement in the public deficit can be seen are eliminated.¹ The study

¹ The authors stress the shortcomings of the 'traditional' approach to assessing the consequences of efforts to improve fiscal equilibrium and the reasons why this approach can misleadingly suggest that fiscal austerity has stimulatory virtues. In order to identify and measure the effort, the traditional approach takes the cyclically-adjusted variation in the primary balance. However, this adjustment never takes into account all the possible impacts of the cycle on the fiscal balance.

then goes on to examine the way in which private spending responded to this consolidation effort. The results are unambiguous.

Contrary to what is sometimes asserted, careful analysis of past experience clearly shows that fiscal austerity does not stimulate private spending. A 1-GDP-point reduction in the primary deficit is associated with a 1% *contraction* in domestic demand. The induced fall in activity is nevertheless smaller: the contraction in domestic demand reduces imports and improves the current-account balance by 0.6 GDP points. As this balance is the sum of private agents' financing capacity and the public balance, the result of this IMF study confirms that past efforts to bring public finances more into balance are far from being entirely compensated by a decline in private agents' saving. In fact, the decline in their financing capacity associated with a 1% reduction in the primary deficit has in these past episodes been only 0.4%.

Growth increasingly constrained by indebtedness

The consequences for developed-economy growth of debt-reduction constraints affecting private and public agents are clear. If the financing capacity of the private agents falls more slowly than the financing requirement of the public agents, the overall financing requirement of the economy is bound to decline. In other words, if private and public agents each make an adjustment, desired or imposed, in their financial balances, the current-account balance of the economy must improve. During this adjustment period, *total domestic spending* – and hence domestic demand – *will have to increase more slowly than their income* – GDP. The external contribution to income growth will have to be positive. The improvement in the current-account balance implied by the adjustment in public and private balances therefore determines the contribution of the external sector to the growth of the economy needed for this adjustment to take place.

The resulting constraint on the domestic growth rate will depend on the evolution of the spending of the rest of the world and on the evolution of the country's market share: the more rapid the growth in demand from

For example, the sharp rise in the US stock market in the late 1990s contributed to an improvement in the fiscal balance – and in the *cyclically-adjusted* primary revenue – without any fiscal consolidation measures being adopted. The authors also eliminate episodes where the tightening was associated with the desire, not to balance the budget, but to curb activity.

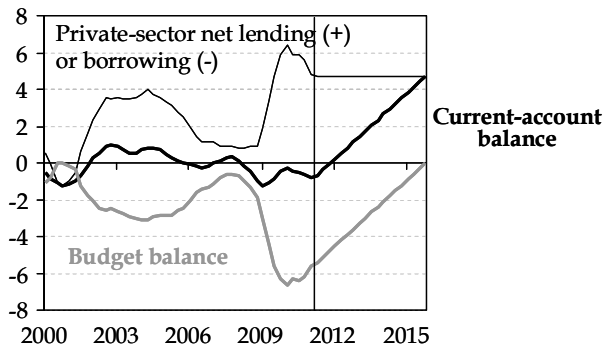
the rest of the world, the greater the improvement in the economy's market shares and the more a high growth rate of its domestic demand will be compatible with the improvement required in its current-account balance – and the greater will be the growth in its GDP. If, on the other hand, demand from its trading partners grows slowly or if the economy loses market share, the same improvement in the current-account balance will be obtained only at the cost of weaker growth in its imports and hence in its domestic spending. Since the contribution of the external sector remains unchanged, by construction, GDP growth will be correspondingly reduced (Box 3).

Box 3. Public and private debt reduction and growth

The consolidation of public finances and the reduction of private-sector debt are going to hold back growth in numerous developed economies. As illustration, it is assumed here that the government wants to reduce its deficit and that, given the need for debt reduction, the financial savings behaviour of the private sector cannot be Ricardian: far from reducing its financial savings ratio at the same time as the government is improving its budget balance, the private sector maintains an unchanged financing capacity. Figure 7 describes this situation.

Given that the sum of the financing requirements or capacities of domestic agents is equal to the current-account balance, this behaviour on the part of public and private agents implies, as one can see, an improvement in the current-account balance. But with what consequences for growth?

Figure 7. Net lending (+) or borrowing (-), 2000-15 (% of GDP)



Note: Data for the period between 2000 and 2011 are for the eurozone.

Let $\varphi^{private}$, φ^{public} and $\varphi^{country}$, respectively, represent the financing requirements or capacities of the private sector, the public sector and the

country. The financing capacity of the public sector corresponds to the budget balance and that of the country to the current-account balance ca (all magnitudes are expressed here as proportions of GDP).

$$\varphi_t^{private} + \varphi_t^{public} = \varphi_t^{country} = ca_t$$

Let Y be the GDP and D the domestic demand. One then has: $ca_t = \frac{Y_t - D_t}{Y_t}$

and hence also $ca_t - ca_{t-1} = \frac{D_{t-1}}{Y_{t-1}} - \frac{D_t}{Y_t}$. For the current-account balance (expressed as

GDP points) to improve, it is necessary that $\frac{D_t}{Y_t} < \frac{D_{t-1}}{Y_{t-1}}$: domestic demand must grow less fast than GDP.

It then remains to calculate the growth rate of Y compatible with the improvement in the current-account balance implied by the behaviour of each country's agents. If, for the sake of simplification, transfers and investment income are ignored, the current-account balance can be written: $ca_t = \frac{X_t - M_t}{Y_t}$,

where X and M are, respectively, the exports and imports of goods and services. By using an export relationship – a function of the real effective exchange rate and demand from the rest of the world – and an import relationship – a function of the country's domestic demand and the same real effective exchange rate – it is possible to calculate the growth rate of domestic demand that permits the attainment of the targeted current-account balance, for given evolutions in the exchange rate and demand from the rest of the world. The more rapid the growth in exports, the more a given improvement in the current-account balance can be compatible with rapid growth in domestic demand and hence also in GDP.

This highly simplistic approach will be applied systematically in Chapters 3, 4 and 5. The time-horizon for the simulations is five years. For each country, two relationships for the simulation of exports and imports of goods and services have been estimated, as well as a block of equations making it possible to calculate the net investment income and transfers. The financing requirements or capacities of the private agents are projected, often as a function of the constraints relating to their individual financial situations. It is then possible to estimate several paths for the consolidation of budget balances and to see what economic growth rates can be associated with them.

The simultaneous adjustment of the balance sheets of public and private agents in the developed economies will therefore, for several years to come, be a source of deflationary pressure for the world economy. The current-account deficits of a certain number of these economies – the

United States and Spain, for example – had previously made it possible to absorb the savings surpluses of the rest of the world. Their reduction – implied by this adjustment – will tend to depress world activity. If these countries spend less without others spending more, the deflationary force whose effect had been partly cushioned in 2008 will again come into play. The difference is that this time it will take the form not of a shock but of continual pressure.

Given that most of the developed countries are being subjected to the same adjustment constraints, their growth, if it is to remain firm, has to be based on the expansion of demand in the emerging economies. Many of these have in fact already adopted strategies to boost their domestic demand. However, the available projections suggest that these strategies will be insufficient, especially if the fiscal adjustment in the developed regions is relatively rapid. Accordingly, at the beginning of 2012, the IMF was continuing to predict the maintenance of substantial surpluses for the emerging regions. This is not compatible with a marked reduction in the public deficits of developing countries over this same time horizon. In these circumstances, some of them run the risk of being caught in a perverse spiral that will lead them full tilt into fiscal crisis, given that contraction in activity and widening of the public deficit go hand-in-hand. Preventing the triggering of such spirals requires that the developed countries do not all simultaneously try to bring their budgets too rapidly back towards equilibrium. Using in the best way possible the room for manoeuvre available to each party in contributing to the outcome is therefore essential. The examination of the public finance situations in Japan, the United States and the eurozone is from this point of view enlightening. It gives an idea of these margins but also of the risks confronting these countries.

3. THE TRAP CLOSING ON JAPAN

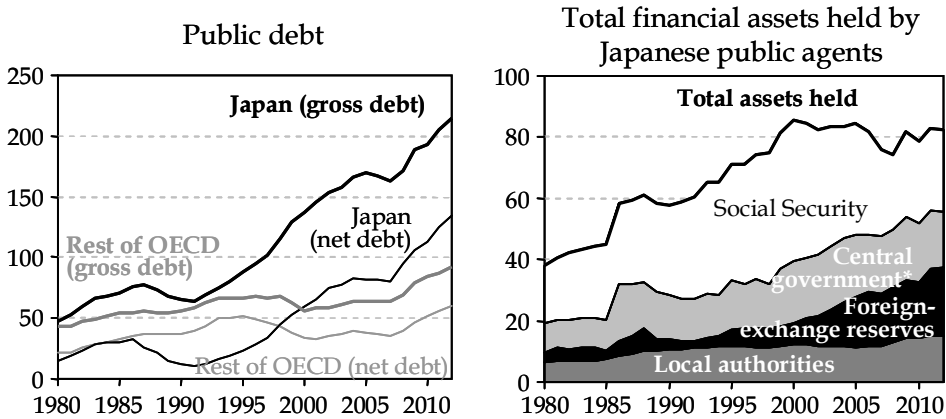
The developed economies whose private savings are going to remain in surplus for several years to come can learn a lot from the evolution of Japanese public finances. In no other country has the budget played to the same extent the role of 'flywheel', making it possible to store excess savings. Starting in the 1970s, with Japan's investment requirements declining, there emerged a surplus of private savings that was first exported to the rest of the world. When in the early 1990s the bursting of the stock-market and real-estate bubbles further reduced domestic investment, the public deficit became the only possible outlet for still overabundant savings. In order to attenuate the deflationary forces at work, the government had no choice but to allow its own debt to increase. Had it not done so, Japanese private agents would not have been able to accumulate their present financial wealth. This particularity, combined with the original features of the Japanese financial system, explains why, at a time when the country's debt is equivalent to over twice its GDP, the government is still borrowing at low interest rates.

This reassuring conclusion, however, should not be allowed to mask the problems facing Japan today. The level of interest rates may be low, but the rate of increase in nominal incomes has for several years now been lower still. And if the Japanese private sector is today still generating a substantial financing capacity, this emanates to an increasing extent from firms. At the same time, the financial system is evolving in a direction that could make the market for Japanese public debt more vulnerable to any doubts that might arise concerning the government's creditworthiness. And, in the case of Japan, the problem of creditworthiness can be summed up in a single concrete question: will the government, whose deficit has until now enabled households to continue to save at a time when firms were paying off their debts, be able when the time comes to achieve the surpluses needed in order to restore their savings to them without eroding their purchasing power?

3.1 Debt ‘without tears’ until now

As a proportion of GDP, Japanese public debt was above 210% at the end of 2012, twice the level for the rest of the OECD countries (Figure 8). Above all, the trajectory followed for two decades is spectacular: between 1992 and 2012, the burden of this debt more than trebled. In Japan, however, even more than elsewhere, looking at just one part of the government’s balance sheet – its liabilities, in this case – is deceptive. Although heavily in debt, the Japanese government at the same time has at its disposal a substantial stock of financial assets, which at the end of 2012 totalled more than 100% of GDP (80% if one excludes the public bonds held by central and local administration, an item not appearing in the figure for gross public debt either). Roughly one-fifth of this was held by local authorities, half by the central administration and the remaining third by Social Security. Japan stands out in this respect from the other major developed countries, notably those of the eurozone and the United States, for the size of the assets held by the social security funds and for that of its foreign exchange reserves. This means that Japan’s net public debt is much smaller than its gross debt. Even so, at the end of 2012 it was above 130% of GDP.

Figure 8. Public debt and financial assets held by Japanese public agents, 1980-2012 (% of GDP)



* Excluding foreign-exchange reserves.

Sources: OECD, Bank of Japan and Thomson Datastream.

The 1990s shock

This high level of indebtedness is the result of a continual build-up of substantial deficits since the mid-1990s. It is worth recalling the

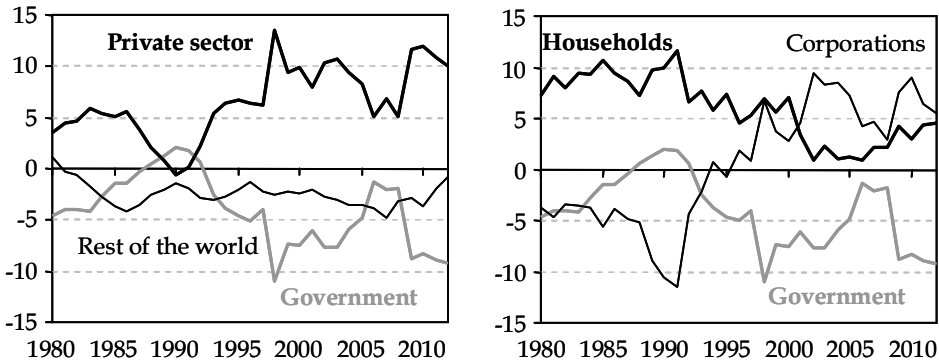
mechanisms leading to this result. Initially at least, these were the same as can now be seen operating in many developed economies. As in these latter economies today, Japanese private agents were heavily indebted at the beginning of the 1990s. Between 1980 and 1989, household debt rose from 90% of their disposable income to almost 140% and that of non-financial enterprises from 170% of GDP to over 210%. Taking advantage of abundant credit, firms borrowed throughout the 1980s to finance a surfeit of investment. Between 1987 and 1990, their investment rose from 19% to 25% of GDP. The return on this investment turned out to be low, however, owing to inappropriate sectoral allocation: the share of purchases of building land, by real-estate promoters but also by small firms, rose from 10% to 30% during the 1980s.

At the beginning of the 1990s, with both households and firms heavily in debt, the bursting of the real-estate and stock-market bubbles was inevitably accompanied by a rise in their savings propensities. Households' financing capacity in fact rose briefly, from 10% of GDP in 1989 to 12% in 1991 (Figure 9). Despite a continued high level of debt, it then fell back, but only gradually, with the ageing of the population becoming a long-term downward influence on the household savings ratio. Households reduced their debt, but only slowly, so that at the beginning of the 2010s, as a proportion of income, it was barely back to its admittedly high level of the end of the 1980s. The abrupt rise in Japanese private agents' financing capacity in the early 1990s is therefore essentially due to the behaviour of the non-financial enterprises: between 1991 and 1993, their financing requirement declined by more than 9 GDP points. The shock was violent. In order to underpin activity, it was the government that then had to borrow instead of firms. The budget balance accordingly continued to deteriorate constantly between 1992 and 1996, from a surplus of 0.6% of GDP to a deficit of 5%.

The effort to consolidate public finances launched in 1997 turned out to be short-lived, with the Asian crisis arriving on the scene to deprive Japan of the buoyant external demand it would have needed in order to compensate for the impact of a restrictive fiscal policy on its domestic demand. In 1998, with the economy again plunging into recession, the public deficit widened abruptly, reaching 11% of GDP, and, despite a slight improvement in 1999, it was to remain around 8% of GDP until 2003. During the following years, the decline in private agents' savings propensity - in reality, that of firms - enabled the government to reduce its deficit somewhat - especially as the intensification of international financial integration was facilitating the absorption by the rest of the world of part of

the excess private savings. Having been close to 2% of GDP in 2001, Japan’s current-account surplus rose to 5% in 2007, on the eve of the financial crisis. As in most of the other developed economies, the 2007-09 shock brought about an abrupt fall in private agents’ spending propensity and forced the government to respond with a further deterioration of its budget balance. At the end of 2012, the public deficit was again approaching 10% of GDP and the intention of the newly-elected Abe government was clearly not to reduce it too quickly.

Figure 9. Net lending (+) or borrowing (-) in Japan, by sector*, 1980-2012 (% of GDP)



* The statistical error has been added to firms’ financing balance (and is therefore also included in the private sector).

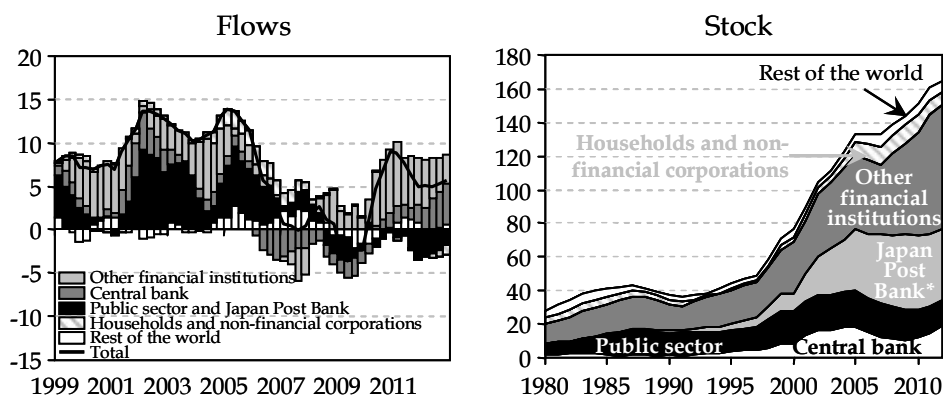
Sources: Cabinet Office and Thomson Datastream.

Public debt in the hands of residents

This review of the sequence of events explaining the deterioration in Japanese public finances illustrates the risks faced by economies that are today in a similar situation to that of Japan in the early 1990s. It also highlights one particularity, namely Japan’s excess of private savings. Since the mid-1990s, the financing capacity of Japan’s private sector has oscillated between 5 and 10 GDP points, and has even been above 10 GDP points since 2009, one of the highest levels for any developed country. With the government, along with the rest of the world, the only agent capable of absorbing it, the private savings surplus can only be invested, directly or indirectly, in public securities or abroad. With Japanese private agents’ high level of aversion to risk leading them to invest the bulk of their financial savings in domestic assets, roughly 95% of the central government bonds (90% if one includes the Treasury bills) was in the hands of residents

at the end of 2012. For the most part, it was held by a financial system whose practices were relatively stable and ‘controllable’. The Bank of Japan (BoJ) held one-tenth of the total outstanding of central government bonds. If one adds the bonds held by the Japan Post group and the Fiscal Loan Fund – a public investment fund created to replace the Trust Fund Bureau – roughly half of the government debt was in the hands of public institutions (Figure 10).

Figure 10. Purchases and holding of Japanese central government bonds (% of GDP)



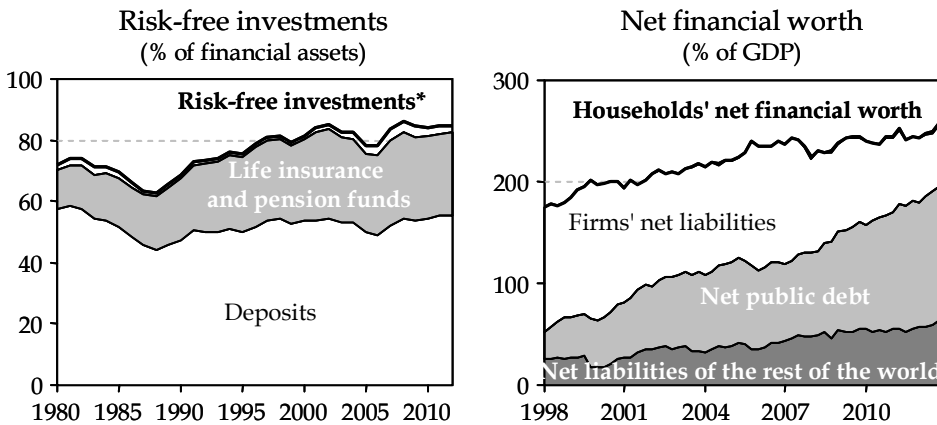
* The stock of public securities held by the Japan Post group includes both the securities held by Japan Post Bank Co, Ltd. and those held by Japan Post Insurance Co., Ltd.

Source: Bank of Japan.

This situation should not come as a surprise: until the mid-1990s at least, the accumulated domestic savings were essentially the work of households (Figure 9), traditionally on the lookout for safe investments (bank deposits, postal savings or life insurance). In part, this behaviour reflected the policy implemented by the government following the Second World War, when, for a long period, the constitution of savings invested risk-free and then lent at low interest to sectors seen as having priority was encouraged. However, the progressive abandonment of this policy and the deregulation that took place during the 1980s failed to produce any significant modification in the quasi-structural preference of Japanese households for safe and liquid investments. At the end of 2012 more than 80% of their assets were still in ‘riskless’ form (Figure 11). Household savings therefore constitutes a virtually ‘captive’ source of finance for the Japanese government.

It would be a mistake, however, to interpret this ‘captivity’ as meaning a crowding-out by the government of other possible borrowers. Since the beginning of the 1990s, it is only the accumulation of public debt that has enabled households’ financial wealth to continue to increase (Figure 11). Failing this, Japanese economic activity would have had to contract to the point at which, with private agents’ income diminishing, their financing capacity had declined to match the financing requirement of the rest of the world (in other words, the Japanese current-account surplus).

Figure 11. Japanese households’ financial investments and net worth



* Risk-free assets comprise public securities, deposits (including postal savings), as well as life insurance and retirement pension investments.

Source: Bank of Japan.

3.2 A debt dynamic impossible to stem at all rapidly

These unique features of the Japanese economy make it possible to understand why, at the end of 2012, the most indebted of all developed-country governments was still able to issue 10-year bonds at an interest rate below 1%. Even so, its margin for borrowing is not unlimited. Even before households start to ‘unload’ part of their wealth, the very special conditions in which Japanese public debt accumulates have begun to change. In the coming years, the government’s financing requirement will increasingly have as a counterpart the financing capacity of firms and no longer of households. In combination with the transformation launched in the financial sector, this evolution could make the rates on Japanese government borrowing more sensitive to market pressures.

A gradual transformation of public borrowing conditions

The drying up of the flow of household savings associated with the continued ageing of the population and the decline in the size of the labour force threatens to complicate the financing of the public deficits. The flow of financial investments by households has in fact fallen from 15% of GDP in the 1980s to 2.5% on average over the last ten years. This slowdown was reflected in a halt to the growth of the balance sheets of the institutions traditionally responsible for collecting household savings. Since the beginning of the 2000s, the size of the balance sheet of the Post Bank has significantly declined.

With the financing capacity of firms gradually replacing that of households, this substitution is also leading to a change in the nature of the purchasers of the public debt. Since 2009 it is the banks – and not the public institutions with which households deposit their savings (Figure 10) – that have been taking up much of the new issue volume. With the increasing financing capacity of firms leading to a contraction in the volume of loans outstanding, the banks, and notably the regional banks, have regarded the purchase of public securities as a means of pursuing their maturity transformation activities. As the government is the only agent whose outstanding debt has increased, public securities have little by little been replacing loans to households and firms in bank balance sheets. At the beginning of 2013, the public securities held by banks accordingly amounted to 20% of their assets as against 5% in the late 1990s. This evolution is liable to reach its limits, however, inasmuch as it makes the banks more sensitive to variations in the market prices of the public securities and exposes them to the possibility of losses. This is particularly the case for regional banks as the stocks they buy tend to be long-dated [Bank of Japan, 2011].

In addition to this change in the agents doing the saving, which is leading the banks to hold increasing amounts of public securities, a modification – so far very gradual – is taking place in the structure of the investment by the institutions that traditionally had been investing in public securities, namely the public pension fund and the Post Bank. Prior to 2001, the reserves of the public pension fund had to be deposited with the Trust Fund Bureau, to be used, like the postal savings, to finance public priority investment. Following a transition period that ended in 2007, this requirement was dropped. And while, until now, the assets of the pension fund and the Post Bank are still composed for the most part of public securities, the investment structure, notably that of the Fund, has changed

over time, with a gradual increase in the share of foreign securities. Statements by the managers of these institutions indicate that this tendency is set to continue, with the share of financial assets invested in emerging countries likely to increase at the expense of Japanese public securities.

In combination with the drying up of the flow of household savings, such a shift, even if only gradual, will modify the pattern of the bond market's equilibrium. The policy changes implemented by the Bank of Japan, at the beginning of 2013, towards a more aggressive monetary easing could of course, more or less durably, provide an offset. Even so, given the considerable scale of the government's refinancing requirements, upward pressure on the interest rates on public bonds can no longer be ruled out. In order to cope with this possibility and continue to borrow at the lowest possible rates, the government could, along the lines of what it had done at the end of the 1990s, shorten the maturity of its debt. It could, as in 2010, issue fixed-rate bonds but with shorter maturities (three years) or, alternatively, as in 2003, develop new products aimed at private individuals such as ten-year *floating-rate* bonds.

Relieving investors of part of the risk that they do not want to take, or are no longer in a position to take, is not the only possibility, however. A return to greater 'financial repression' is also conceivable. Whereas since the mid-1980s, in order to encourage the development of the financial markets, the government has made special efforts to lift regulatory bans one by one, it could tomorrow reverse the process, for example by limiting the tendency to diversification recently launched by the public pension fund. Finally, if there were to be the threat of a sharp rise in bond rates, the Bank of Japan could increase its purchases of public securities and, by extending the duration of its bond buying, put a cap on the level of bond rates in a move similar to the one started in April 2013 by the new Governor, Haruhiko Kuroda, to help 'reflate' the economy. One thing is certain, in any case: commercial banks cannot forever continue to absorb large quantities of public issues without dangerously weakening their balance sheets.

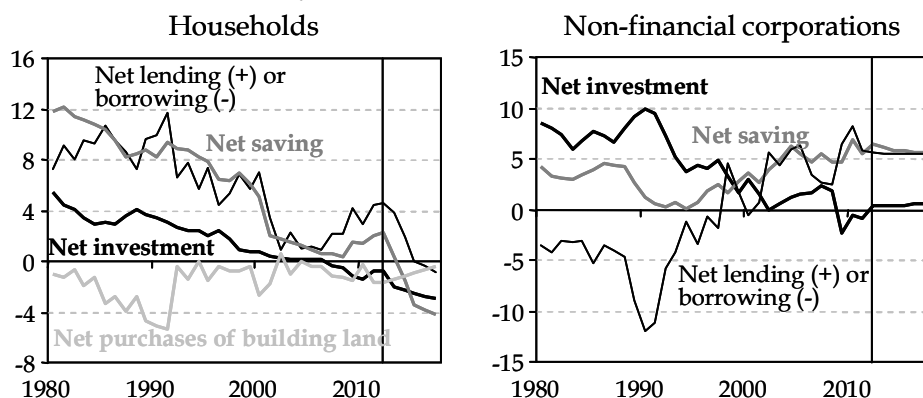
Fiscal consolidation posing a risk to growth

The shock imposed by the financial crisis of the end-2000s came at a time when the financial environment in which the Japanese government was borrowing was very different from the one seen at the beginning of the 1990s. One remark can serve to summarise the situation: if the tendencies associated with the ageing of the population persist, households' financing

capacity will disappear before the end of the decade. If nothing is done to reduce the budget deficit, the volume of public securities needing to be held, for its part, will continue to increase. Putting a halt to this trend will not be easy. In order simply to stem the rise in the public debt ratio, the government – if one takes an average borrowing rate 130 basis points higher than the nominal growth rate, as was the case in 2012 – has to *improve its budget balance by around 10 GDP points*. In other words, the primary deficit of 8.5% of GDP in 2012 would have to be replaced by a surplus of roughly 2% in 2017. If the effort is gradual, net debt will continue to climb, before stabilising at a high level of close to 150% of GDP within this time horizon. Remaining for any considerable period with such a high level of debt at a time when household wealth will be starting to decline and when the role of public agents on the demand side of the bond market is also declining would be dangerous.

Alongside efforts to stabilise the burden of its public debt, Japan must at the same time bring its economy out of deflation. At what pace can this adjustment in the primary balance be achieved without excessively depressing activity? Clearly, the answer depends in the first place on the expected evolution in the financing capacity of domestic agents (Box 3). As regards households, this evolution could, as we have seen, be relatively favourable to a rebalancing of the budget. The ageing of the population – by 2020 almost 30% will be aged over 65, compared with less than 10% at the beginning of the 1980s – will in fact continue to depress the household financial savings ratio (Figure 12).

Figure 12. Changes in private agents' net lending (+) or borrowing (-) in Japan, 1980-2017 (% of GDP)



Sources: Cabinet Office and authors' own calculations.

Close to 5% at the end of 2012, this ratio should fall to zero by 2015, later turning more and more negative. Compared with the 2.5% positive financing capacity achieved by households over the period of the 2000s, this shift will help to underpin growth in domestic demand, everything else remaining equal. On the other hand, the evolution in the financing capacity of firms is unlikely to be as growth-friendly.

Since the middle of the 2000s, Japanese non-financial firms have each year posted net savings of the order of 5% of GDP (Figure 12). Given that their net investment was virtually nil, this meant that their financing capacity also oscillated around this level. By contrast, the financing capacity of financial firms recorded a marked fall, from around 3% of GDP in 2000 to close to 0% in 2012, this being largely explained by a rise in capital transfers, linked notably to transfers of pension funds from the private sector to the public sector or to transfers of assets from public financial firms to the central government. In order to make a projection of firms' total financing requirements, account was taken of the fact that their primary income in relation to GDP tended to fluctuate with activity. It was then assumed that the tax rate on these incomes remains stable. Finally, it was assumed that their investment was such as to ensure 0.8% annual growth of potential GDP between now and 2017.² On these assumptions, the financing capacity of Japanese firms, which had risen to around 9% of GDP during the financial crisis, should stabilise at around 5% for the rest of the decade, equivalent to the average level for the 2000s (it had already fallen to 6% by end of 2012).

What would be the consequences of a relatively rapid effort – say, between now and 2017 – to stabilise the public debt-to-GDP ratio? Despite the favourable nature of the expected evolution in the financing capacities of private agents, such an effort would nonetheless imply *an appreciable improvement in the current account*, from 1% of GDP in 2012 to 4% in 2017. In a world economy where many other developed countries will themselves be seeking to increase the external contribution to their growth, such an increase in the Japanese surplus is hard to envisage, except if it were to be obtained by a sharp decline in domestic demand. With an exchange rate staying at its end of March 2013 level and adopting the IMF's October 2012

² More precisely, with global factor productivity rising by 0.9% a year – the observed average for the period 1991 to 2007 – and with the number of hours worked declining by 0.6% a year, the required growth in investment is around 2% a year.

growth assumptions for demand from the rest of the world, GDP should in this case fall by 0.8% a year on average until 2017. Stabilisation at a later date, i.e. 2022 – a target date close to that contained in the government's June 2010 budget consolidation plan [Cabinet Office, 2010] and reaffirmed by the new government in early 2013 – would still permit only slightly positive growth over 2012-22. It should be noted that the fact that this growth rate is positive is in part attributable to the expected dynamism of Japan's new trading partners. Between 2000 and 2012, the structure of its exports has in fact shifted in favour of emerging regions with rapidly expanding demand. For example, the share of exports going to China rose from 5% to almost 20%, while the corresponding proportions for the United States and Europe fell from 30% to 17% and from 18% to 10%, respectively.

Moreover these projections do not take into account the possible consequences of the earthquake and nuclear accident that took place in March 2011. The study published by the Japan Center for Economic Research in June 2011 [JCER, 2011] indicates that these events could severely complicate the task of future governments. And even if it were possible to restart the quasi-totality of the nuclear power stations, Japan's dependence on fossil fuels is bound to increase. This rise in the propensity to import will, for a given fiscal tightening and unchanged growth in demand on the part of trading partners, weaken its growth prospects.

Action perpetually postponed?

These prospects lead to an initial conclusion: as long as firms achieve a substantial financing capacity, putting Japanese public finances back on a sustainable path is bound to be very gradual or risk asphyxiating activity. This gradualism, it should be noted, was already an underlying principle of the government's June 2010 plan – which aimed at halving the primary deficit by 2015 and achieving a primary budget balance by 2020. Provision was also made to suspend temporarily the adjustment in the event of exceptional disturbance, even at the risk of delaying the stabilisation of the debt ratio. As part of this consolidation effort, a rise of the consumption tax from 5% to 10% was finally approved in 2012 along with some curb in expenditure, allowing a reduction of 4 to 5 GDP points of the primary deficit (but leaving the total deficit above 5% of GDP by 2020!).

Despite a pro-growth rhetoric, the new Abe's government does not seem to have radically departed from this logic: still pledging to maintain the medium to long term target present in the June 2010 plan, Abe's Cabinet decided on 15 January 2013 to introduce some stimulation,

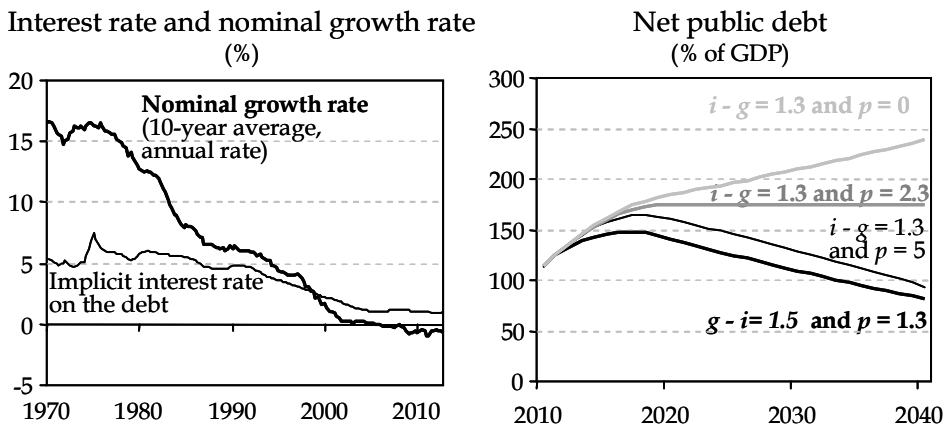
approving a fiscal stimulus of 10 trillion yen (i.e. 2% of GDP) to support a broader recovery. Absent further adjustment, beyond the authorities' current plan, Japanese net debt is therefore set to continue to climb until around the end of the decade and substantially exceed 150% of GDP. The financing of this additional public debt will still not necessarily involve the crowding out of other borrowers. If the government finds itself having to continue to borrow, this will be precisely because of a shortage of borrowers ready to take its place and absorb the available saving. Upward pressure on bond rates cannot be excluded, even so. If at some time in the future the savers or the collectors of savings lose confidence in the government's capacity to keep its debt situation under control, they may no longer wish to buy government issues.

The trap the Japanese government has to avoid therefore becomes clearer. Over the next few years, the requirements of macroeconomic management will prompt it to carry out a slow reduction in its budget deficit and allow the burden of public debt to continue to rise. Looking further ahead, however, it will nevertheless, at some stage, have first to stabilise and later reduce the debt burden. From the end of the 2010s, Japanese households' financial wealth could well stop increasing. Continuing to allow public debt to increase would then place the Japanese government in a situation of growing vulnerability. Both Japanese firms and the institutions with which they place their assets could at some stage prefer to hold claims on the rest of the world rather than Japanese public securities. In order to prevent this risk, the public debt must evolve in parallel with households' financial wealth. This calls for a sharp improvement in the government's primary balance.

For the purpose of illustration, if the difference between the interest rate at which the government borrows and the nominal economic growth rate prevailing at the end of 2012 were to remain unchanged, a primary surplus of more than 2 GDP points would have to be maintained from 2020, if the net debt is to remain stable as a percentage of GDP (Figure 13). A simple mechanical calculation, however, indicates that a decline in household financial wealth of around 60 GDP points by 2040 could easily be implied by the effect of population ageing on households' financial savings ratio. In this case, the government will not only have to stabilise its debt, but to reduce it: assuming the same difference between growth and interest rates as above, this could only be achieved by maintaining a lasting primary surplus of around 5 GDP points.

A more favourable scenario can of course not be ruled out: if the gap between the nominal growth and interest rates were closed, the required primary surplus would fall from 5% to 3% of GDP. Assuming now that interest rates could, thanks to aggressive intervention by the Bank of Japan, durably remain 1.5% *below* nominal growth, the required surplus would fall to slightly above 1% of GDP. The priority put by the newly-elected Prime Minister, Shinzo Abe, on lifting Japan's economy out of recession and ending deflation by all means is certainly pointing in that direction. Known as 'Abenomics', his strategy rests on three pillars, depicted in Japanese symbolism as "three arrows": monetary policy should be eased aggressively – pushing the yen down, raising equity prices and boosting confidence – fiscal policy should turn expansionary and a growth strategy should be implemented to promote private investment. Even so, although higher nominal growth would definitely facilitate the needed fiscal adjustment, even the target of attaining a primary surplus of 1% in 2022 – as already set in the June 2010 Plan – would remain difficult to reach. Starting from a primary deficit of 8.5% of GDP in 2012, achieving in practice a 10-GDP-point improvement in the budget balance is no easy matter (even if a part of the initial deficit is cyclical in nature). This gives an idea of the amount that the Japanese government will have to levy on future generations if the commitments made to those who were yesterday's savers are to be met.

Figure 13. The dynamics of public debt in Japan



Note: i is the average nominal interest rate paid (%), p is the primary balance as % of GDP and g is the nominal growth rate of the economy (%).

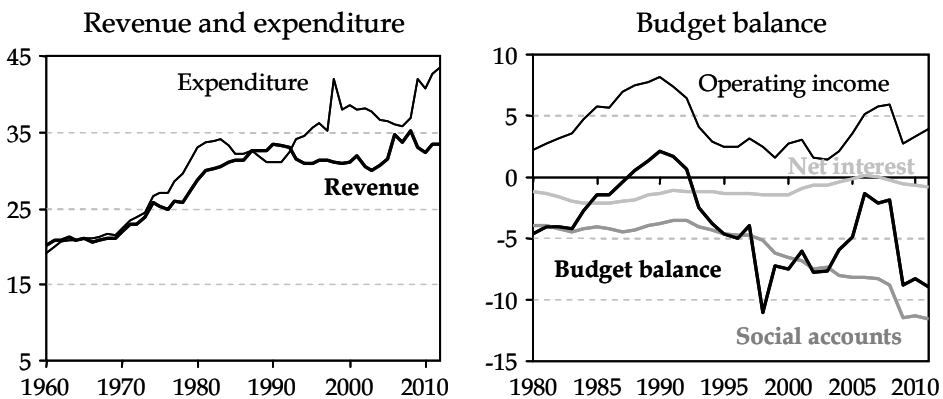
Sources: Thomson Datastream and authors' own calculations.

3.3 An increasingly daunting challenge

Rebalancing the budget is not only a macroeconomic challenge; it is also a political one. At some time in the next few years, the Japanese government is going to have to take a stand on questions that it has so far not fully answered. How in practice will the adjustment of the primary balance needed to stem and then reverse the tendency in public debt be implemented? What expenditure will be reduced and what taxes will be raised to achieve in the future the transfer of resources implied by the repayment of at least part of the debt already built up? The problem of intergenerational equity this poses is a complex one and the forces at work could call into question the Japanese 'social model', notably its healthcare and pension systems, long regarded as particularly egalitarian (Box 4).

The past evolutions in budgetary revenue and expenditure give a first idea of the choices made so far: revenue as a share of GDP has remained stable since the early 1990s, while expenditure has constantly increased. The evolution of the budget balance broken down into main functions gives a more precise picture of these choices (Figure 14). Since the beginning of the 1980s, the public deficit has been due mainly to the deterioration in the social accounts (pensions and healthcare). The remainder of the budget – comprising 'regalian' functions such as defence, law and order, etc., but also education – has been close to equilibrium. Net interest payments have, so far at least, played only a marginal role.

Figure 14. Formation of budget balance in Japan (% of GDP)



Sources: OECD and Cabinet Office.

Since the mid-1990s, with the ageing of the population, social benefits, pushed upward by a rapid rise in healthcare spending and

pensions, have risen distinctly more rapidly than the contributions provided by either employers or employees, the result being a steady deterioration in the equilibrium of the social accounts (Figure 14). Faced with the problem posed to the budget by the population ageing, Japan is nevertheless currently better placed than the average of the other developed countries. Admittedly, in the coming years the proportion of the population aged over 65 is set to continue to climb, but at a distinctly slower rate than that seen since 1995. To judge by various available studies, the bulk of the rise in social spending as a proportion of GDP now seems to be over. However, it would be an illusion to hope that it might be reduced significantly. Even if the nominal growth in healthcare spending could be limited to 1-1.5% per year over a decade – it was 4% a year over the past three years! – this would cut spending as a share of GDP, assuming nominal growth of 2% a year, by 1 point at best [IMF, 2011a].

Box 4. Social benefits central to the rise in Japanese public spending

According to the OECD, the Japanese health system is one of the world's best performers, in terms of access to healthcare (it is one of the most egalitarian), cost (private and public spending together amount to only 8.5% of GDP, compared with the OECD average of 9.5%) and effectiveness (the Japanese population's state of health is one of the best in the world). Health insurance is universal (covering the quasi-totality of the population), patients are free to choose their doctors and the cost per inhabitant is low in view of the country's level of development. In 2007, 50% of the spending was financed out of social contributions (generally a fixed percentage of salary, paid in equal amounts by employers and employees), 37% by the government (25% by central government and 12% by local authorities) and 14% by a co-payment from patients [NIPSSR, 2011]. Furthermore, competition between insurers is forbidden (insurers normally offer the same services at the same price), as also is profit-making. Over the past three decades, growth in healthcare spending has therefore been fairly small, rising as a share of GDP by barely 2 points compared with more than 7 points in the United States, and this at a time when the ageing of the population was much faster in Japan. In the coming years, growth in *public* healthcare spending could remain limited. According to the IMF [2011b], it should rise by 1 GDP point between now and 2030, compared with more than 5 points in the United States. Other studies are more cautious, expecting a somewhat faster growth in healthcare costs.

The Japanese healthcare system is far from problem-free, however. There are increasing shortages of specialists and substantial delays in the marketing of new drugs. Above all, the upward drift in healthcare spending poses a problem

of intergenerational equity. If Japan wants to keep benefits at their present level despite the population ageing, contributions, particularly those levied on the younger generations, are going to have to increase. A calculation made by the Japanese government in 2005 already showed a total net gain (meaning that benefits received over a lifetime exceeded contributions) for the generations born before 1943 of the order of ¥48,750,000 per household (\$640,000 at the mid-2011 exchange rate), but a net loss for the generations born after 1983 of the order of ¥45,850,000 (\$600,000). The increase at the end of the 2000s in the co-payments due from the oldest age group was partly aimed at correcting intergenerational inequalities.

Population ageing poses a similar problem for the retirement pension system. Here again, Japan's system is fairly redistributive. It is universal and comprises a basic regime (National Pension, NP) giving entitlement to a fixed sum, combined with a complementary public system giving entitlement to an additional income based on past salary (Employee's Pension Insurance, EPI). The replacement rate is lower than in other OECD countries, but the coverage is broad and the security for lower-income households is greater.

In order to cope with the increase in costs due to population ageing, Japan reformed its system in 2004. Contribution rates were raised – the monthly contribution to the basic system is due to rise from ¥13,300 in 2004 to ¥16,900 in 2017 (expressed in constant 2004 yen) and the contribution to the EPI will rise gradually over the same period from 13.6% to 18.3%, with the replacement rates reduced. For an average household, this rate will be gradually reduced from 59.3% in 2004 to 50% in 2023. This reform should enable the government to draw only gradually on its reserves, as these are theoretically sufficient to maintain pension spending in balance for the next hundred years! [Horioka et al., 2007] This rise in contribution rates means that the cost for the central budget between 2010 and 2030 will be nil, compared with a developed-country average exceeding one GDP point [IMF, 2011b].

However, the erosion of public confidence in the system could at some stage threaten its financial equilibrium. In August 2008, only 20% of those questioned said they had confidence in the system (for comparison, the corresponding figures for Denmark and Finland were 74% and 66%, respectively). Young people, in particular, are contributing less and less, either because they do not think they can meet the minimum conditions of 25 years of contributions to the basic system or because they regard the system as too expensive. As a result, half the workers aged less than 35 no longer pay their contributions, despite the fact that this is in principle compulsory. In 2009 the ratio between pension contributions collected and the amount expected was only 60% [NIPSSR, 2011]. Unlike the social contributions of full-time workers, those of the self-employed, farmers, part-time workers and the unemployed are not in fact automatically deducted from wages and salaries and with the financial sanctions in the event of non-payment – loss of rights excepted – not

dissuasive, non-salaried workers increasingly frequently fail to pay their pension contributions [Suzuki & Zhou, 2010]. Moreover, with the rise in the number of temporary contracts – 46% of young Japanese aged between 15 and 24 in 2010 were in this situation, compared with 17% in 1988 – an increasing number of young people are often not covered by the EPI system. Here again, a Japanese government [Cabinet office, 2005] has shown that in 2005 there was marked intergenerational inequality, with the younger generations contributing more to the system than they can expect to get out of it.

Making significant cuts in other areas of public spending would be just as difficult. In 2011, *net* public investment was nil (and the Fukushima nuclear accident is likely to push this spending up, at least temporarily), education spending was low (at 3.5% of GDP in 2009, it was the lowest of all the OECD countries) and the remaining budgetary expenditure also seemed hard to compress. A 10-year freeze on nominal growth in all non-social expenditure would at best reduce the deficit by 2.5 GDP points [IMF, 2011a]. And if education expenditure is excluded, the freeze would reduce the deficit by only 2 GDP points, while excluding investment brings the figure to 1.5 points. It will thus be difficult to improve the budget balance by bringing non-social security spending down by more than the 1.5 GDP points announced in mid-2012. In the absence of substantial room for manoeuvre on the expenditure side and barring a cut in pension benefits, the elimination of the budget deficit is bound to mean an increase in revenue.

Higher tax revenue or the return of inflation?

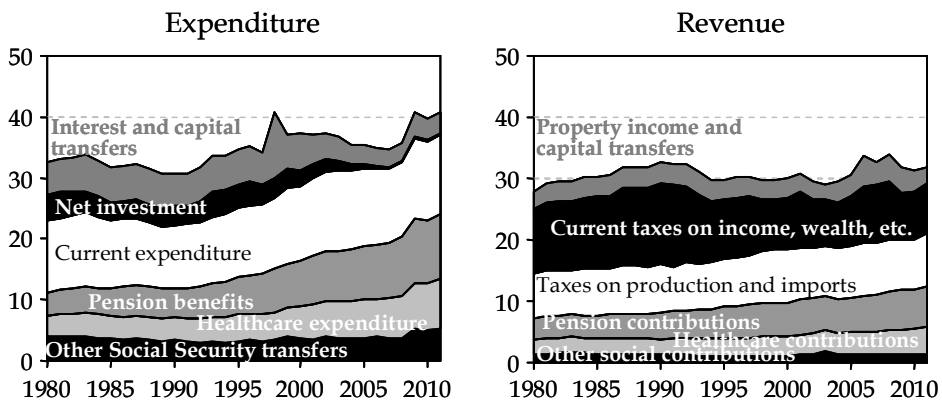
Here lies the nub of the problem. Deciding on the modalities of a rise in public levies is precisely what successive governments in the 1990s and 2000s failed to do. To a large extent the transfer of resources that took place during these two decades was to the benefit of the older citizens. It was they in fact who benefited most from the social spending financed in large part by the active labour force and, to an increasing extent, out of borrowing. The Japanese electoral system, which leads to an over-representation of older citizens living outside the large towns, makes it extremely difficult to adopt measures aimed at reducing this transfer, especially if they tend to increase the tax pressure on this part of the electorate [Eichengreen et al., 2011].

However, increasing revenue (Figure 15) should be made easier by the fact that the burden of taxes in Japan is the lowest of all the major

developed countries. With taxes equivalent to less than 17% of GDP compared with more than 25% of GDP in France and almost 30% in the United Kingdom and Italy, Japan is situated far below most of the other G7 countries. In particular, the VAT rate is extremely low. Having risen from 3% to 5% in 1997, it is currently well below the average 2012 rate of 18.7% for the OECD countries that have adopted this form of tax. Moreover, because of the ageing of the population, the tax base can be expected to grow more rapidly for VAT than for taxes based on earned income [IMF, 2011a]. In addition, raising the VAT rate would somewhat reduce intergenerational inequalities, as the burden would be spread over the whole of the population, both inside and outside the active labour force. A progressive rise from 5% to 15% would bring in, everything else remaining unchanged, around 5 GDP points, which would be a significant proportion of the needed budgetary improvement.

It should be noted, however, that such a measure remains highly unpopular, as demonstrated by the strong reactions from politicians and the population when at the end of 2011 Prime Minister Yoshihiko Noda proposed a gradual increase. After months of debate and discussion – and a promise to dissolve the lower house of parliament! –, the Diet eventually passed a bill on August 2012 to increase the consumption tax rate from 5% to 8% in April 2014 and to 10% by October 2015. This legislation is unlikely to be the last word in the tax debate, however .

Figure 15. Budgetary expenditure and revenue in Japan (% of GDP)



Source: Cabinet Office.

Another measure that might be considered is an increase in corporation tax. Firms, as we have seen, are today the principal source of

the savings surplus. However, room for manoeuvre in this respect is limited. With a tax rate of close to 40% and a total levy of the order of 4 GDP points (prior to the drop related to the 2007-09 financial crisis), Japanese firms already pay more taxes than firms in most of the other OECD countries. An increase would certainly meet strong resistance from firms, whose representatives traditionally maintain close relations with the political parties. The obvious final possibility is to increase social contributions, whose relative stability is at the origin of the widening of the public deficit. A rise in employers' contributions, inasmuch as it would eat into corporate profits, would meet opposition similar to that towards an increase in taxes. On the other hand, a rise affecting only employees' contributions would merely aggravate the existing problem of intergenerational inequity and intensify still further the phenomenon of attempts to evade paying social contributions seen for several years now (Box 4). Such a rise would have to affect pensioners as well, so that they too would contribute to the efforts made by the government, in part to preserve the purchasing power of their savings.

The fiscal consolidation needed in the coming decades if the Japanese government is going to be able to meet its debt commitments is not impossible, but the effort implied has become considerable. For lack of political agreement, the public deficit threatens to persist at the very time when households, probably as soon as the end of this decade, will be starting to dis-save. In that event, domestic demand would rise faster than potential production and the long period of deflation that Japan has experienced since the beginning of the 1990s would come to an end. Admittedly, its foreign exchange reserves should enable it for a time to finance a possible current-account deficit. Fairly rapidly, however, inflationary pressure would be bound to emerge, in which case the Japanese government, rather than meeting its debts, would allow their value to be eroded. Clearly, it could not do this without the collaboration of the Bank of Japan, which, by maintaining an accommodating stance or even by purchasing public securities, would prevent any crowding-out mechanism via interest rates from coming into play. Such a "collaboration" has recently been obtained by the government, with the Bank of Japan bowing to domestic political pressure and pledging to massively buy government bonds. The problem is that the mere anticipation of such an evolution could fairly rapidly lead those who currently are holders of Japanese bonds to look for more remunerative investments elsewhere... and raise fresh concern about the possibility of a global currency war.

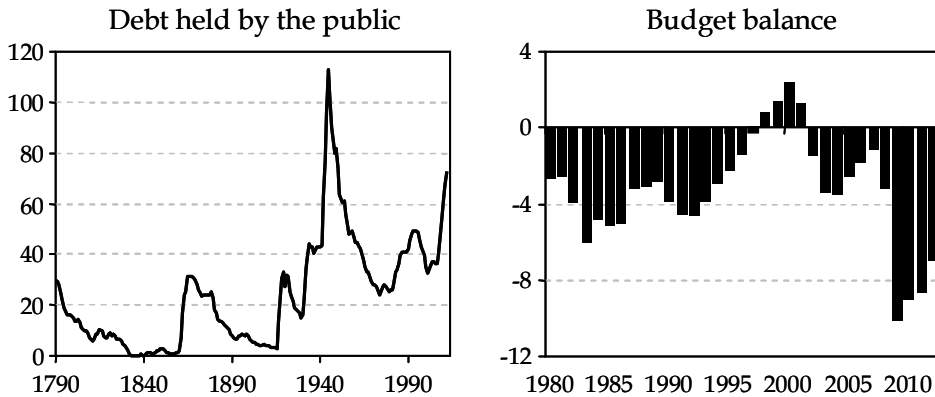
4. THE AMERICAN GAMBLE

The American public finance situation differs from that of Japan in many respects. In particular, it is difficult to say that public borrowing in this case played the role of ‘flywheel’ making it possible to store up domestic savings. For more than 20 years, the United States has been a massive importer of savings from the rest of the world. And yet, as in Japan, for a decade or more the maintenance of a substantial public deficit has played a key role in underpinning economic activity. Admittedly, the measures taken in the past decade have still been far from strictly Keynesian: the aim of the tax cuts introduced by George W. Bush in 2001 was not to boost expenditure, but to stimulate supply. Even so, fiscal support was decisive in helping the economy to absorb a succession of severely recessive shocks, from the bursting of the stock market bubble in 2000 to the financial crisis of 2007-09. The accumulation of budget deficits that resulted has had huge consequences: the debt-to-GDP ratio at the beginning of the 2010s was the highest ever, apart from the war years (Figure 16).

Faced with this spectacular deterioration, the ‘benign neglect’ shown until very recently by the United States may seem surprising. In the immediate aftermath of the latest financial crisis, the government clearly gave priority to a return to growth over a reduction in the federal deficit: by 2012, the latter, at close to 7% of GDP, was still higher than it had ever been in the preceding decades. The reasoning underlying this American strategy is fairly simple: tightening the fiscal screw before growth has picked up, at a time when monetary policy is impotent, would be suicidal; however, once the upturn is assured, the deficit can and must be reduced. The gamble taken is that doubts will not surface too soon in the meantime regarding the sustainability of US public debt. For the gamble to come off, growth must pick up before a new shock arrives to disturb it and a credible political agreement has to be reached that sets out how public borrowing will gradually be put back on a sustainable path. What makes this gamble

riskier though is that, even before this episode, the budget balance was already seriously threatened by the prospect of distinctly more rapid growth in spending than in revenues, notably under the impact of the evolution in healthcare costs. At the same time, recent years have shown that the capacity of the US Congress to agree on how to rebalance the Budget has been seriously diminished by deep-rooted political divisions.

Figure 16. The US federal government's debt and budget balance (% of GDP)



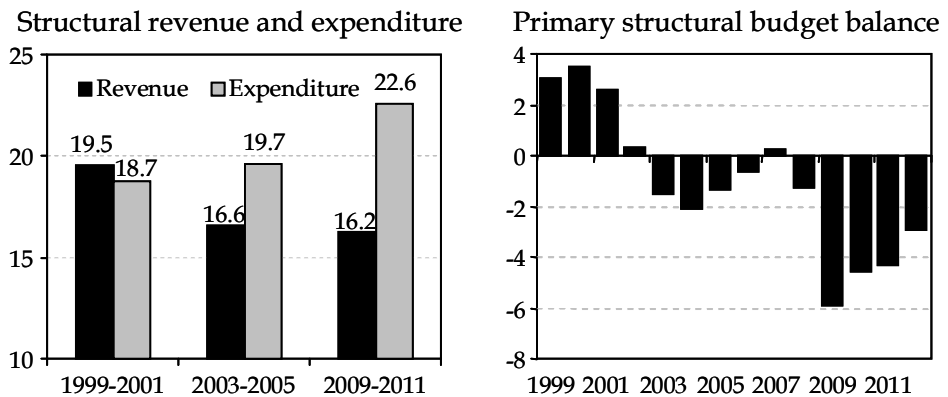
Source: Congressional Budget Office.

4.1 A decade of widening public deficits

At the end of 2012, American gross public debt was close to 105% of GDP (85% for the federal government and 20% for states and local government), implying almost a doubling in just 10 years. Net debt posted a similar evolution, increasing from 44% to more than 86% of GDP. This tendency, much the same as that seen in other OECD countries, mainly reflects that of the federal government debt: despite the difficulties encountered by states and local government, their gross debt barely rose between 2002 and 2012. In fact, only a handful of states – California in particular – had recourse to the issuance of short-term debt in order to finance current expenditure, most of the others being prohibited from doing so by law. In the aftermath of the financial crisis, in order to compensate for the states' and local governments' lost tax revenues and to avoid their having to introduce excessively tight policies, the federal government as early as 2009 made massive transfers in their favour as part of its stimulus package – the American Recovery and Reinvestment Act. These transfers covered roughly one-third of the states' current financing needs in 2009 and 2010 and also enabled them to finance infrastructure expenditure.

The deterioration in the federal finances was by no means the consequence only of the 2007-09 financial crisis, however. Between the beginning and the middle of the 2000s, the ratio of government revenue to GDP, adjusted for the cycle, fell by three points, while that of its expenditure rose by one point (Figure 17). Over this period, the structural *primary* budget balance slipped from a surplus of 3% of GDP to a deficit of 1.5%, making a deterioration of more than 4 points, much the same as that seen in the second half of the 2000s. Seen in a longer-term perspective, therefore, the accumulation of deficits has been continuous since the beginning of the 2000s. How could this have come about?

Figure 17. The US federal government's structural budget balance, 1999-2012 (% of potential GDP)



Source: Congressional Budget Office.

Fuzzy fiscal discipline

The 'windfall revenues' due to the firm growth of the latter 1990s were at the heart of the 2000 electoral debate. Whereas Vice President Al Gore wanted to lock these surpluses away in order to be able to help meet future pension requirements, George W. Bush, for his part, wanted to "give people their money back" in the form of tax cuts, as duly took place following his inauguration and the adoption, as early as June 2001, of the Economic Growth and Tax Relief Reconciliation Act, and later in May 2003 of the Jobs and Growth Tax Relief Reconciliation Act. These two programmes could not have been voted through, however, but for the expiration of the budget rules introduced in the second half of the 1980s.

Persistent high public deficits in the early part of the decade had in fact prompted the legislators in 1985 to pass a law known as the Gramm-Rudman-Hollings Act, which imposed year-by-year reductions in the deficit and a return to equilibrium in 1991. In the event of failure to observe the ceilings set, automatic cuts were to be imposed on most programmes. In order to circumvent this automaticity, the President and the Congress rapidly became highly 'creative', however, positing growth assumptions that were so favourable that it was easy – on paper – to reach the objectives set [Reischauer, 1993]. Not only were these objectives never actually attained – at 3.9% of GDP, the deficit posted in 1990 substantially overshoot the initial target of 0.6% – but the deficit barely declined over the second half of the 1980s. The approach contained in the 1990 Budget Enforcement Act was less ambitious but more effective, the objective being not so much to reduce the deficit as to impose on the President and the Congress the systematic respect of the budget on which they had agreed. By setting a cap on discretionary expenditure and introducing a 'pay-as-you-go' rule, requiring that any measure that increased the cost of social programmes or reduced taxes had to be 'deficit-neutral', in other words financed *ex ante* by a reduction in other expenditure or a rise in other taxes, the Budget Enforcement Act, combined with a robust political will to reduce the deficits,³ permitted a return to budgetary equilibrium in 1998. Thanks to the exceptional economic conditions of the late 1990s, the Budget was even in surplus by more than 2% of GDP in 2000. The voting of the promised tax cuts and the expiration in 2002 of the rules set out in the Budget Enforcement Act, as well as the rise in defence spending linked to the conflicts in Iraq and Afghanistan, however, would soon rapidly reverse the tendency (Figure 16).

By underpinning domestic demand at a time when a succession of shocks (stock market slump, the attacks of 9/11, rise in the oil price, etc.) each posed a threat to activity, the fiscal policy decisions taken at the beginning of the 2000s had an appreciable positive effect on the economic situation. Even though, in part, they had been intended not to stimulate expenditure but to encourage saving by households, the tax cuts – like the rise in defence spending – helped to prevent the start of a deflationary

³ In summer 1990, President George H. Bush finally accepted the principle of a tax rise that he had rejected during his electoral campaign and in 1993 President Bill Clinton succeeded in putting through by a small majority a rise in the marginal tax rates on the highest incomes.

spiral. On the other hand, the impact on the budget balance was substantial. Despite a return to growth of better than 3%, the federal deficit declined by only one-and-a-half GDP points between 2003 and 2006, partly because of the lost revenue resulting from the tax cuts. While, thanks to the recovery, the debt/GDP ratio rose relatively little, the size of the structural deficit was making the American budget vulnerable to a slowdown in growth and, *a fortiori*, to a contraction in activity. On the basis of cyclically-adjusted data from the Congressional Budget Office (CBO), it can be estimated that half the rise of some 30 GDP points in debt between 2008 and 2011 was due to the stimulus packages introduced in 2008 (Emergency Economic Stabilization Act) and then in 2009 with the American Recovery and Reinvestment Act, but half was also due to the severe recession in 2007 and the ensuing slackness of growth.

Two years after the start of the upturn, in September 2011, activity in fact remained distinctly more depressed than in a 'normal' cycle, with GDP more than 6 points lower than indicated by the median of the post-war recoveries. This should not have come as much of a surprise. Typically, upturns in the American economy are driven initially by residential investment and consumption of durable goods, with corporate investment in productive capital following after a time-lag normally exceeding one year. By stimulating the sectors most sensitive to interest rates – residential investment and consumption – the easing of monetary policy normally contributes to re-boosting growth. However, a high stock of unsold housing, substantial household indebtedness and falling real estate prices, among other things, deprived the 2009 upturn of its usual driving forces: it was only in 2012 that residential investment, after having sharply contracted, started to pick up again. Without the support of the budgetary stabilisation plans but also of the exceptional contribution of demand from the rest of the world, there is no doubt that the economic recovery would have been more sluggish still. The slackness of the recovery explains at the same time that of job creation. Unlike the 'jobless recovery' of 2003-04, the 2009 upturn was in the first place an upturn (almost) without growth!

The United States therefore entered the decade of the 2010s with a high unemployment rate and a badly misshapen social pyramid: among the close to 9 million jobs destroyed by the recession, the majority were middle-income; at almost 14%, the poverty rate⁴ for the 18-64 age group

⁴ The poverty threshold for a four-person family unit was \$22,811 in 2011 (\$11,702 for one individual).

was the highest since 1966 (when the series began) and the proportion of those living below *half* the poverty threshold had just reached the record level of 6.6%. At the same time, the deterioration in public finances was manifest, with a deficit of close to 9% (including those of states and local government) and substantial debt. At the end of 2012, the most frequently used indicator – the federal debt held by the public – stood at 72.5% of GDP. And even this did not take into account the off-balance-sheet commitments of the federal government, which had since September 2008 taken into conservatorship the two large mortgage securitisation agencies (Fannie Mae and Freddie Mac). At the same time, five years after the start of the subprime crisis, households' debt excesses were not fully digested, the on-going upturn was still fragile and potential growth was probably lastingly weaker than at the end of the 1990s. To make things worse, it had become obvious that the ideological divide between a Democrat President and a Republican-dominated House has become an almost structural stumbling-block in the shaping of fiscal policy.

4.2 A delicate return to budget equilibrium

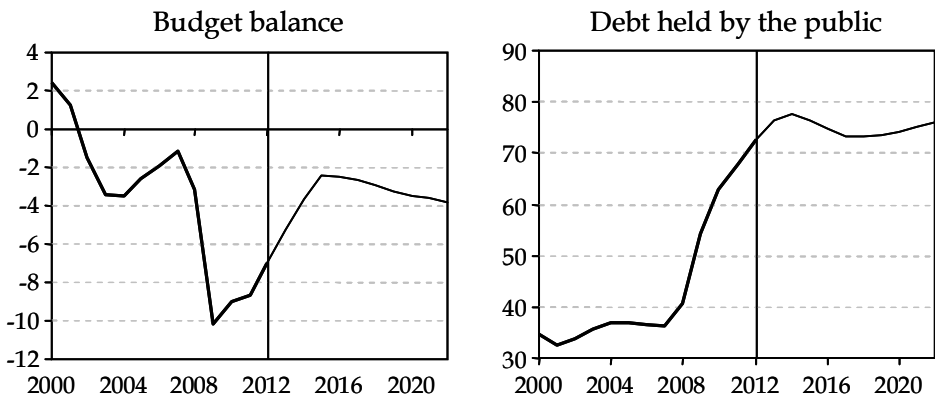
Nonetheless, the projections made in February 2013 by the Congressional Budget Office (CBO) could be seen as reassuring. *Assuming no change in legislation*, the CBO was expecting a reduction in the federal deficit to 2.5% of GDP by the middle of the decade, followed by a widening to slightly below 4% by 2022. On this trajectory and with CBO's assumption that the average borrowing rate would rise only gradually to the nominal growth rate, the federal debt-to-GDP ratio would rise from 72.5% in 2012 to 78% in 2014, fall slightly in the following years and be back at that level by 2022 (Figure 18).

At first glance, this outcome might appear satisfactory: at mid-decade, the debt ratio would roughly stabilise, albeit at a high level and with a tendency to drift upwards from 2017 on. Being made after the enactment of the American Taxpayer Relief Act of 2012, this CBO projection takes into account a continuous adjustment of the AMT threshold to inflation – one of the provisions of the Act – and hence avoids the systematic overestimation of future revenues that was a usual feature of its former 'no change in legislation' projections. It also of course includes the other provisions of the Act. The top tax rate for single taxpayers whose income is above \$400,000, in particular, is permanently increased from 35% to 39.6%. And the controls on spending that were agreed in connection with the raising of the debt ceiling in August 2011 [CBO, 2011] are assumed

to be implemented. The caps on discretionary spending foreseen by the Budget Control Act passed at that time as well as the automatic cuts that were to come into play if no further agreement were reached by Congress are also taken into account in this projection. As a result, total discretionary spending – defence and non-defence – is growing much slower than nominal GDP and by the beginning of the next decade will represent less than 6% of GDP, a much lower proportion than anything seen in the past decades.

These results obtained by the CBO are not a forecast, however, but the outcome of a projection exercise: the actual implementation of such bold across-the-board controls on spending, for a whole decade, is far from being assured. Whatever its limitations, the exercise gives a measure of the effort that the US has to make, from 2013 on, in order to roughly stabilise its public debt-to-GDP ratio: the primary federal deficit has to be reduced by 5 GDP points in the coming years.

Figure 18. CBO's baseline federal budget projections, 2013-22 (% of GDP)



Source: Congressional Budget Office.

Such a reduction of the primary deficit would not be unprecedented; in the 1990s, the primary balance improved by 6 GDP points from a deficit of 1% of GDP to a surplus of 5%, but this improvement was helped by the firm growth posted towards the end of the 1990s. The improvement assumed this time by the CBO is somewhat more modest but is to be achieved largely by 2015, in other words much faster; moreover, in the present environment, the restriction it implies is bound to hold back growth. Here, it is worth recalling the assumptions underlying the CBO's calculation, namely that growth accelerates to 2.6% in 2014, returns to a

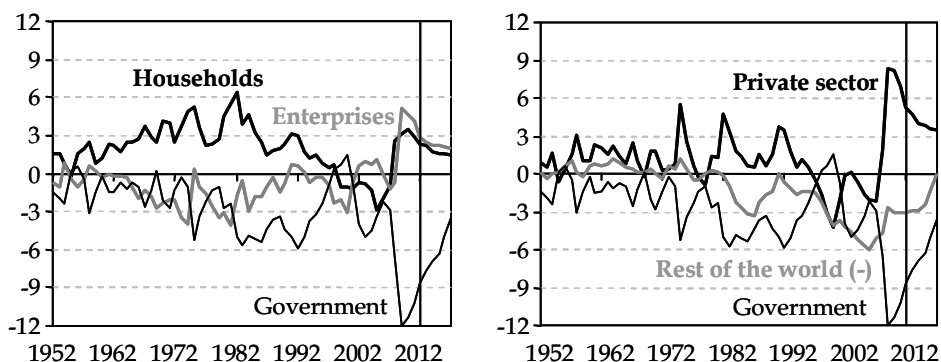
firm rate of 4% per year over 2015-18 – enabling the unemployment rate to fall back to 5.5% in 2018 – and averages 2.2% over the 2019-22 period. Counting on a lasting acceleration in growth as early as in the middle of this decade is audacious in that the attempts to reduce the public deficit could place a significant curb on activity. Weaker growth, though, would imply the need for still more budget tightening in order to effectively stabilise the debt-to-GDP ratio.

Re-balancing the budget

It is therefore essential to estimate the rate at which the adjustment in the primary balance can take place without excessively depressing activity. The answer will obviously depend, as was pointed out in Chapter 2, on the evolution in the financing capacity of American private agents for the coming years. The greater the fall in their financial saving propensity when the Budget is tightened, the weaker will be the curb on growth. On the household side, there is still little chance of any very favourable evolution; the need to cut back excessive debt is likely to keep their financial savings ratio in positive territory and it seems reasonable to assume that it continues to fall gradually to 1-2% of GDP in 2017 (Figure 19).⁵ Firms, meanwhile, are in a much better financial situation. In 2012 their net interest payments were equivalent to 18% of operating income, close to the lowest levels seen in the past four decades, while at the same time, whereas they normally post a financing gap, at the end of 2012 they still had a 3-GDP-point NIPA financing *surplus*. Assuming that their investment is at the level needed to ensure annual potential GDP growth of close to 2.5% between now and 2017 and taking into account the persistent high ratio of profits to GDP, their financing capacity is likely to decline only marginally in the coming years and could be around 2% of GDP at the end of 2017 (Figure 19).

⁵ Households' net borrowing is likely to become positive but remain low in order to permit their debt service, which had reached 14% of their income in mid-2007, to remain below 11%.

Figure 19. US financing capacities and requirements by sector, 1952-2017
(% of GDP)



Sources: Bureau of Economic Analysis, Federal Reserve and authors' own calculations.

This being so, what would be the consequences of a relatively rapid reduction of the public deficit? Let us assume, to illustrate the challenge the US economy is confronted with, that the public deficit is brought back to around 3.5% of GDP by 2017. With a federal deficit at 3%, the reduction is thus slower than assumed in the CBO baseline scenario. While slightly higher, the debt/GDP ratio would be stabilised at around 75%. Taking account of the expected evolution in private agents' financing capacities, and assuming them to be unaffected by the measures taken to implement the fiscal tightening, this improvement in the public deficit *implies that the US economy returns to equilibrium on current account in 2017* (at 3.5% of GDP, the financing surplus of the private sector is exactly equal to the public deficit).

The growth in domestic demand compatible with such an evolution will in turn depend on demand from the rest of the world, the dollar's real effective exchange rate and any other factor influencing the current account. Adopting the IMF's October 2012 projections for growth in the United States' trading partners, the elimination of the current-account deficit can only be achieved, at an unchanged real exchange rate for the dollar, at the cost of relatively weak growth in domestic demand. GDP could hence grow by 2.4% a year over 2013-17,⁶ while the unemployment

⁶ Increased production of shale oil and gas is taken into account by an 'exogenous' 1-GDP-point improvement in the US current account; the result assumes, however,

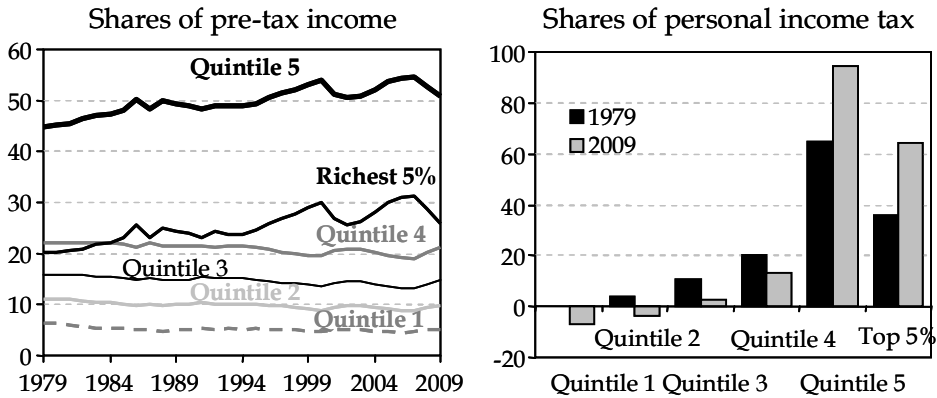
rate would remain just below 8%, well above the 5.6% expected in the CBO baseline scenario. A fall in the dollar could ease the constraint hampering American growth. A depreciation of around 15% in the dollar's real effective exchange rate would permit GDP growth in excess of 3% a year over the same period, with the unemployment rate falling back to slightly above 6%. These calculations are enlightening: as long as households and firms post a substantial financing capacity, putting American public finances back on a sustainable path with an unchanged dollar exchange rate implies a durably high unemployment rate.

Keeping growth going, if possible

Of course, the nature of the measures taken to rebalance the budget could be such that the pressure on growth is alleviated. The decision taken at the end of 2012 to increase taxes for only the better-off households is one way of easing the curb imposed on growth by fiscal consolidation. By restraining savings rather than expenditure, it makes it possible to reduce the federal deficit at the expense of households' financing surplus (and not of their spending propensity). But by adding only 0.3 GDP points to federal income, the compromise found may not have gone far enough in this direction. Since the beginning of the 1990s, income and wealth inequalities have in fact increased. This shift has meant a significant rise in the share of income tax paid by the wealthiest: at the end of 2009 it was 94% in the case of the upper quintile, compared with 65% in 1979, and that of the highest-income 5% (those who earned over \$134,000 in 2009) was 64% (Figure 20). By extending the end of 2012 tax increase to all of the 5% higher-income taxpayers, federal revenues could be increased by another 0.3 of a GDP point without weighing significantly on household spending.

that this increase in production does not translate into any change in the private propensity to save.

Figure 20. Income inequality among households in the US, 1979-2009 (%)



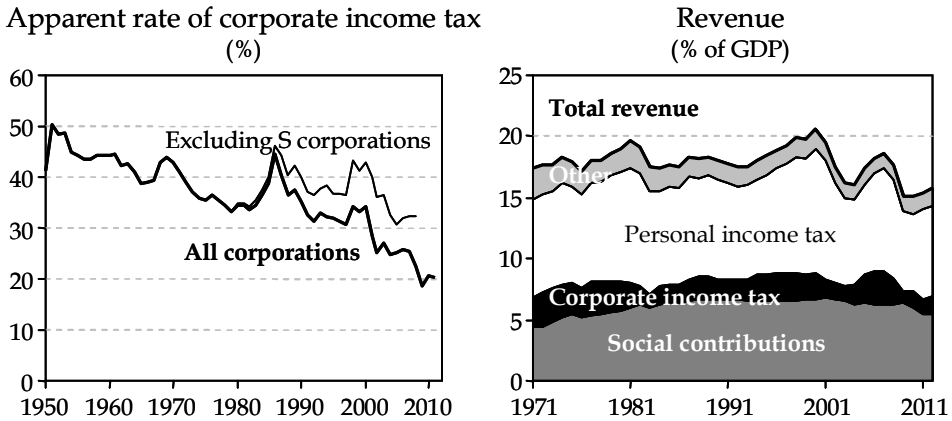
Source: US Congressional Budget Office.

Increasing the rate of taxation on corporate profits – although a measure not even the Democrats seem keen to press for – could also permit a reduction in the budget deficit without excessively curbing growth. Since the beginning of the 1950s, the apparent rate of corporation tax has fallen from 50% to 20%. Admittedly, part of this fall is due to a rise in the proportion of so-called ‘S corporations’, which are not liable to this tax, their shareholders being taxed individually (regardless of whether profits are distributed or not). Having been very small prior to the 1986 tax reform, the share of these corporations in total profits was 30% in 2008. Adjusting the apparent rate of corporation tax for this evolution puts the observed fall in a slightly different perspective (Figure 21) but does not eliminate it.

Such a fall is in fact common to most of the developed countries. Markle & Shackelford [2010], on the basis of company data, show that the effective rate of taxation on companies fell by around 10 points in the Netherlands and the United Kingdom and by 5 points in the United States. Like those in other countries, American firms are today making substantial profits which the slackness of demand discourages them from investing in their totality. At the end of 2012, financial assets accumulated in liquid form by non-financial firms alone exceeded 11% of GDP (\$1,800 billion), almost twice the proportion seen at the beginning of the 1990s. Raising, temporarily at least, the rate of corporate tax or eliminating certain concessions – these cost the budget some \$100 billion annually [Kocieniewski, 2011] – could contribute, to restoring budget equilibrium without having too great an impact on activity. Admittedly, corporation tax is not a large revenue-earner, bringing in only 1.6% of GDP in 2012

(Figure 21). A 5-point increase in the effective rate of corporate income tax would bring it closer to its long-term average and increase revenue by roughly 0.5 of a GDP point, correspondingly reducing firms' financial surplus.

Figure 21. Corporate income tax and budget revenue in the US



Sources: US Bureau of Economic Analysis and Internal Revenue Service.

Taken together, the above two measures could help improve the Budget balance by close to 0.5-1 GDP point, while at the same time diminishing the private saving propensity by roughly the same amount. Implementing these measures would make it possible to achieve the same amount of fiscal tightening as in the CBO baseline scenario without placing any additional curb on growth. Hence our scenario set out above of slightly over 3% growth over 2013-17 could be reached with 'only' a 10% fall in the dollar's real exchange rate (instead of the 15% previously assumed). Arithmetically, a return to balance in the American primary budget by the end of the decade, at the latest, is thus far from impossible.

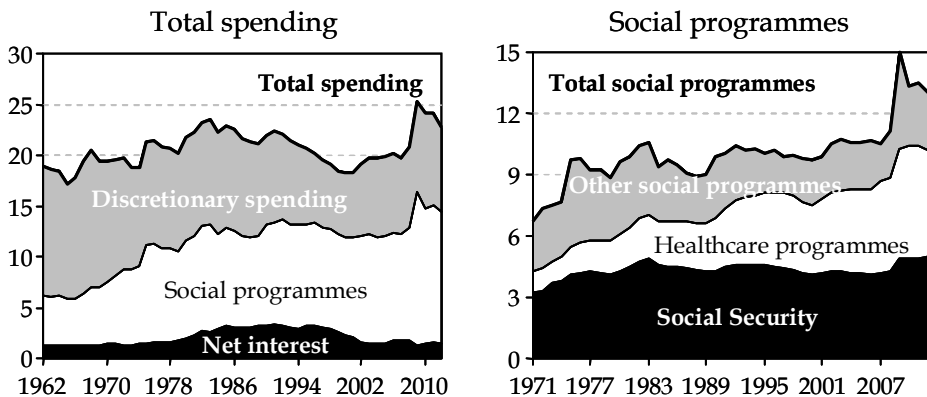
However, seen from the standpoint of early 2013, the political process by which the federal budget would be placed - and kept - on this reasonable path is not nearly as clear. The stalemate seen in Congress in the summer of 2011, due mainly to the intransigence of Tea Party Republicans towards any rise in tax rates, was a clear illustration of this. The incapacity of Congress to find, as was then hoped, an agreement by end-2012, to avoid the automatic spending cuts from being enforced shows that things have not improved since. This political paralysis, which has already led to the loss of the United States' AAA status with Standard and Poor's, is all the more damaging in that it also makes it impossible to say how the key

budgetary problem of the following decade, namely the financing of social programmes, will be resolved. And the fact is that, the sooner the United States is able to say how it intends to reform these programmes in order to deal with the problem, the more time it will have at its disposal during this decade to put the public debt back on a sustainable path.

4.3 A calculated risk?

The evolution in the composition of budgetary spending over recent decades gives a first impression of the tendencies at work and of the questions on which the Administration and Congress are going to have to reach a decision. With the creation in the mid-1960s of the public healthcare programmes (Medicare for those aged over 65 and Medicaid for the most disadvantaged), the share of social programmes in the budget increased rapidly, from less than 5% of GDP in 1965 to almost 10% in 1975. The relative stability seen between the mid-1970s and 2000 masks a constant rise in the share of the budget devoted to Medicare and Medicaid. This increase has accelerated in the past 10 years or so (Figure 22). As a result, between 2000 and 2010, healthcare spending as a share of GDP rose by two additional points, as much as in the preceding 20 years.

Figure 22. Evolution in US federal government spending (% of GDP)



Source: US Congressional Budget Office.

The need for reform of social programmes

The United States is today confronted, like other countries, with the problem of reforming the public pension and healthcare systems and this is no easier than elsewhere. In the United States, as in most developed countries, the ageing of the population gives increased political power to

the principal beneficiaries of these programmes. Aware of the problem, Tip O'Neill, the former Speaker of the House of Representatives, had as early as the 1980s commented, in referring to Social Security, "touch it and you die". The Patient Protection and Affordable Care Act, reforming the health insurance system, signed by President Obama in March 2010 gave an example of the political energy consumed in negotiating these reforms.

Others of a similar nature will nevertheless be necessary in order to contain the rise in the burden of social programmes or to ensure their financing. In its June 2012 long-term projection, the CBO [2012] accordingly predicted a continuous upward tendency in the cost of these programmes in the coming decades, notably due to rising healthcare costs. Assuming an unchanged legislative environment, the reaching of retirement age by the baby-boom generation would increase social security benefits to 6.2 GDP points in 2037, a rise of 1.3 points. In particular, under the combined impact of ageing and medical progress, the cost of healthcare programmes would increase substantially and durably, from 5.3% of GDP in 2012 to 7% in 2022 and around 9.5% in 2037. The three main social programmes (Social Security, Medicare and Medicaid) would account for slightly more than 15.5% of GDP in 2037, compared with 12.5% in 2022 and 10.2% today (Figure 23)!⁷

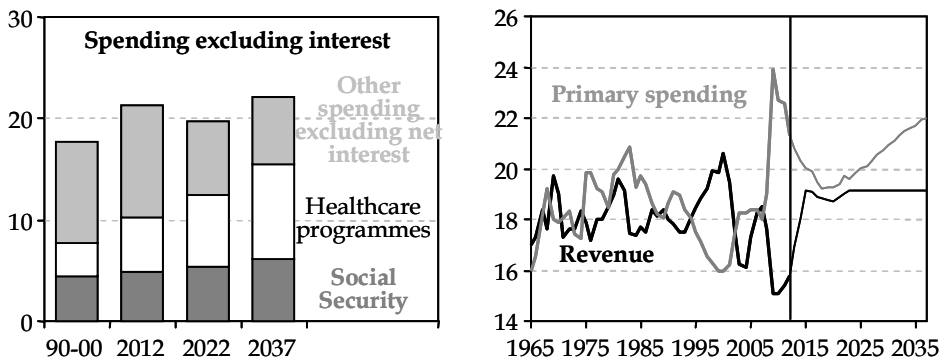
All in all, in the absence of major reform, the upward tendency in spending on social programmes will increase the primary budget deficit by more than 5 GDP points, 3 of which would materialise in the period between 2022 and 2037. Entering the next decade with an unbalanced primary budget would then be all the more dangerous in that the margins for reducing other expenditure headings would have narrowed. In 2022, discretionary spending would account for only 5.6% of GDP, compared with 8.3% in 2012. It would therefore be necessary to halve this ratio over

⁷ Moreover, spending commitments of a social nature by state and local governments are also substantial and their pension fund reserves are insufficient. Some observers believe that the under-capitalisation amounts to \$700 billion, others that it is even more than \$3,000 billion [Lav & McNichol, 2011]. And to these amounts there should be added \$500 billion relating to healthcare programmes. While the problem is severe in certain states, Illinois and California for example, it is on average much less serious than these impressive sums might suggest: for the state and local governments as a whole, contributions to pension funds account for less than 4% of the current budget and bringing them up to 6% would probably be sufficient to eliminate the imbalance being evoked [Munnell et al., 2010].

the following 15 years to compensate for the rise in spending on social programmes! The prospect of a gradual deterioration in the primary budget balance of the order of 2 or 3 GDP points starting in 2022 might at first sight seem to be little cause for concern. However, given the burden of accumulated debt at this date, the debt dynamic generated could rapidly become uncontrollable: with a balanced federal primary budget (a total federal deficit of ‘only’ 3% of GDP) in 2021, the debt/GDP ratio would already rise from around 75% of GDP in 2022 to 95% in 2037 (note that starting from a deficit of 5%, the debt/GDP ratio would soar above 130%).

The challenge facing the United States can therefore be summarised as follows. Far-reaching reform of the social programmes is needed in order to eliminate, either by reductions in expenditure or increases in financing, the disequilibrium that will keep growing in the next decades. It would nevertheless be unrealistic to think that such reforms could provide additional primary resources for the rest of the budget. Common prudence hence requires that the United States enter the next decade with, at the very minimum, a federal deficit below 3% of GDP (i.e. a primary budget close to balance) as is the case in the rebalancing scenario outlined above. Otherwise, increasingly substantial tax rises would be necessary to stabilise the debt ratio.

Figure 23. Projections of US federal government spending and revenue (% of GDP)



Sources: Congressional Budget Office [2012, 2013] and authors' own calculations.

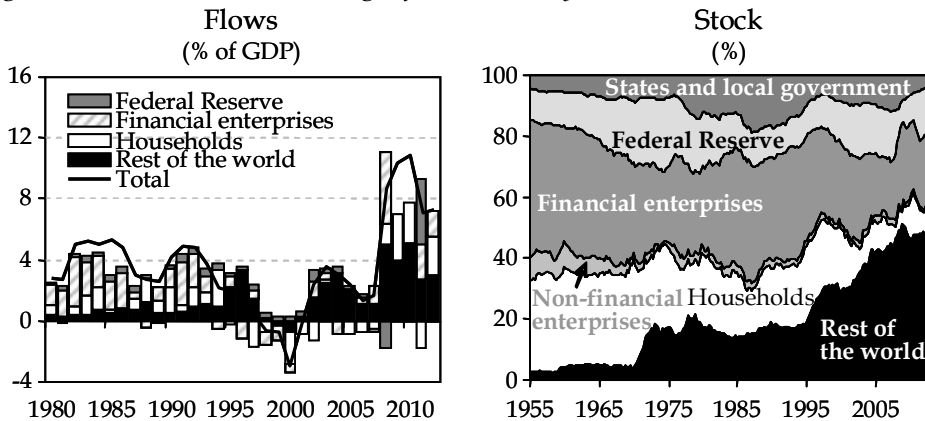
The difficulties involved in this return of American public debt to sustainability must nevertheless not be underestimated. Given that the return would be gradual, the United States will remain for several years vulnerable to forces or to shocks that would restrain growth more than has

been envisaged so far. This would be the case if the international environment were to turn sour. If, for example, there were to be an oil shock in the next few years or if growth in the emerging regions were to slow down substantially, the American authorities would be faced with difficult choices. The same would be true if the needed depreciation of the dollar were not to take place. Moreover, with the debt/GDP ratio continuing to climb for some years yet and stabilising at a historically high level, doubts could surface, at one time or another, concerning the government’s creditworthiness, and this could jeopardise the equilibrium of the entire American bond market.

Bond market balance ensured by the outside world – or by the Fed

The pattern of demand on the Treasury securities market has already altered substantially. Whereas, between 1995 and 2007, the “rest of the world” took up most of the issues, these purchases accounted for around 40% of the total between 2009 and 2012. Since 2008, domestic agents largely took up the running from the rest of the world (Figure 24) while, far from rising, long-term interest rates crumbled. The Fed, without any doubt, played a role in this achievement. Its heavy buying of long-term bonds – whether Treasuries or Mortgage Backed Securities (MBSs) – managed to bring the term premium into negative territory. Most of its influence however was verbal: by communicating extensively its intention to keep its ultra-accommodative stance for an ‘extended period’, it brought down expectations on future real policy rates [Bernanke, 2013].

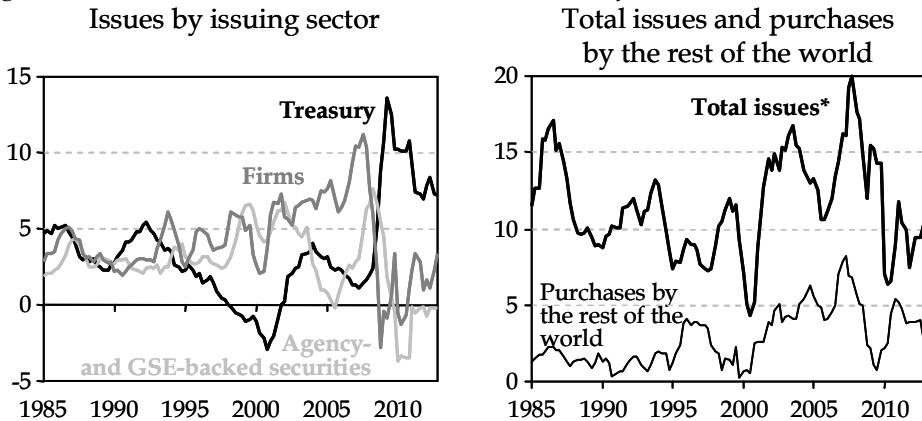
Figure 24. Purchases and holdings of US Treasury bonds



Source: Federal Reserve.

Can moderate long-term rates persist in the absence of continuous bond buying by the Fed? In a recent study, Celasun & Sommer [2010] expressed their doubts. Highlighting the unlikelihood that foreign demand will increase at the same rate as issues of US Treasury paper, the authors conclude that real interest rates must rise if private domestic agents are to absorb in the future an increased share of the issues of public securities. A broader look at the equilibrium of the bond market as a whole nevertheless leads to somewhat different conclusions. While, expressed as a share of GDP, issues of Treasury paper have increased substantially since 2007, total bond issues, for their part, have fallen by half: companies and the mortgage securitisation agencies (Fannie Mae and Freddie Mac) have issued hardly any securities since 2009 (Figure 25). This is not surprising in itself, of course: as elsewhere, the government has simply stepped in to replace the missing private borrowers. As long as this situation persists, there will be no crowding-out by the government of any other borrower and no reason to expect a resulting rise in real bond rates.

Figure 25. Net bond issues in the US, 1985-2012 (% of GDP)



* Debt securities issued by the US Treasury, state and local governments, mortgage agencies and enterprises.

Source: Federal Reserve.

If one now looks at the evolution in the position occupied by the outside world on the *whole* American bond market, it turns out that this has hardly changed. Admittedly, there has been a modification in the composition of its bond purchases: on average from 2008 to 2012, the rest of the world has not been a net buyer of bonds issued by firms or mortgage securitisation agencies but has purchased, each year, distinctly more Treasury paper than in the previous decade. Since 2007, however, the share

of the *total* stock of American debt securities held by foreigners has remained remarkably stable: taking one year with another, they absorbed slightly more than one-quarter of American issues (Figure 25) and at the end of 2012 still held almost half the stock of US Treasury securities (Figure 24).

If the US budget evolves according to the scenario outlined above (leading to a federal deficit of 3% of GDP by the end of the decade), the world demand for foreign exchange reserves should continue to ensure a sufficient outlet for Treasury issues. In our scenario, these issues would average \$660 billion per year. If the share of the dollar in foreign exchange reserves remains close to 65% and if these continue to be held up to 85% in the form of securities, the demand for US bonds from foreign monetary authorities would rise by close to \$500 billion per year⁸ – largely enough to continue absorbing half of the coming issuance of Treasury securities.

Throughout the phase of return to sustainability, which should bring the federal deficit to 3% by the middle of the decade, there is obviously a possibility that tensions may emerge: the issues would be substantial in volume and the commitment to reduce the deficit could be questioned. If, however, there were to be the threat of a steep rise in bond rates, the Fed would not hesitate, at least as long as the recovery remains fragile, to ensure, as it did recently, the equilibrium of the market. The Federal Reserve Act in fact gives it this explicit responsibility, stipulating that the central bank must seek “to promote effectively the goals of maximum employment, stable prices, and *moderate long-term interest rates*”. The Fed Chairman, Ben Bernanke [2010], reaffirmed this, saying: “The goal of moderate long-term interest rates is frequently dropped from statements of the Federal Reserve’s mandate not because the goal is unimportant, but because moderate long-term interest rates are generally the by-product of price stability.”

The risks attendant on the American budget strategy therefore seem to be of a fairly calculated nature. While the threat of a rapid rise in public borrowing costs seems to be containable, the consequences for American society of persistently weak growth and high unemployment could be dramatic. This means that maintaining growth is seen as more urgent than rapid consolidation of the public finances, with the Federal Reserve

⁸ This calculation is based on the IMF’s autumn 2012 projected current-account surpluses of emerging countries in Asia and the Middle East.

possibly intervening to keep interest rates low until such time as recovery is assured.

Obviously, this strategy does not exempt the United States from undertaking the substantial effort to reduce the deficit that is needed to stem the rise in the public debt ratio; it simply leads it to spread the effort over time. This in turn exposes the country at any moment to increasing doubts regarding its creditworthiness and these doubts can be expected to lead, if not to a rise in interest rates, at least to a decline in the dollar: foreign holders of US Treasury securities would be quite likely to want to sell them, more or less suddenly. This risk of a loss of confidence could be significantly reduced if reform of the healthcare programmes were to rapidly eliminate the prospect of a constant deterioration in the budget imbalance starting from the beginning of the next decade – and if a clear-cut political agreement were to emerge concerning the way in which public debt should be placed on a sustainable trajectory in the meantime.

5. THE EUROZONE DRAMA

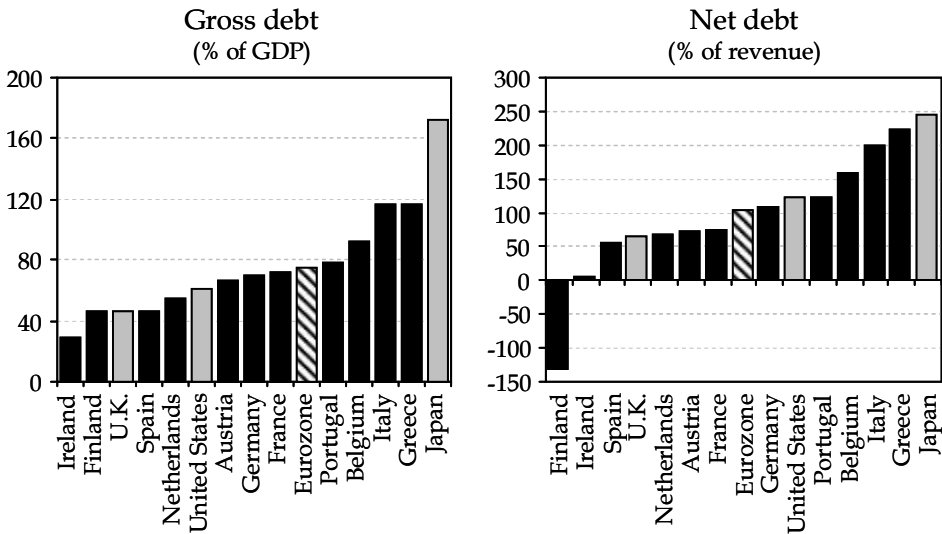
It may seem surprising at first sight that it was in the eurozone that the sovereign debt crisis broke out. Admittedly, the public finances of the European countries have often been the subject of particular attention. For one thing, the burden of government spending in these countries, especially in the social field, is higher than in the United States or Japan. However, when they created the single currency, the European countries had taken care to put in place rules aimed at limiting public deficits and public debt, precisely to prevent any risk of budgetary crisis. Unfortunately, not only were these rules not respected, but the monetary integration led to an unexpected divergence in the borrowing behaviour of the various countries' private agents. The 2007-09 crisis put a sudden stop to this tendency. As elsewhere in the world, budget balances deteriorated and some countries found themselves in a particularly vulnerable situation.

Having wanted each country to remain responsible for its own debt, the eurozone members then found themselves faced with an unexpected situation: there was nothing to prevent doubt regarding the creditworthiness of one country from affecting those whose financial positions threatened to raise similar doubts. They were accordingly unable to prevent a particularly perverse form of market dynamic from exerting knock-on effects on all those whose debts or deficits might give rise to concern. This dynamic in fact gradually came to be used by those governments - Germany's, in particular - that wanted to induce all the eurozone states to achieve rapid reductions in their deficits and to strengthen the arrangements aimed at containing their future borrowing. These evolutions will, for several years to come, act as a curb on growth and, by increasing social and political tensions, threaten the very existence of monetary union.

5.1 Europe’s weakness

Towards the end of 2006, on the eve of the financial crisis, the gross public debt of the eurozone countries was close to 75% of their GDP, compared with barely 60% for the United States. Within the zone, the ratios varied widely, from Ireland at one extreme, with only around 30%, to Greece and Italy at the other, with 120%. To have a better idea of the burden imposed by these debt levels, one can also compare them with the budget revenue available to service them. On this basis, the gross public debt of the eurozone countries, again in 2006, at the equivalent of slightly less than two years’ tax revenue, was comparable to that of the United States. If the debt is now measured on a net basis, the eurozone figure falls to only around one year’s tax revenue, compared with a figure of slightly over one year for the United States. On this same net basis, the differences between eurozone countries were spectacular, with Finland having accumulated *net assets* in 2006 equivalent to more than one year’s tax revenue and Greece and Italy, for their part, posting *net liabilities* amounting to more than two years’ revenue, not far off the figure for Japan (Figure 26)!

Figure 26. Public debt in the eurozone, 2006

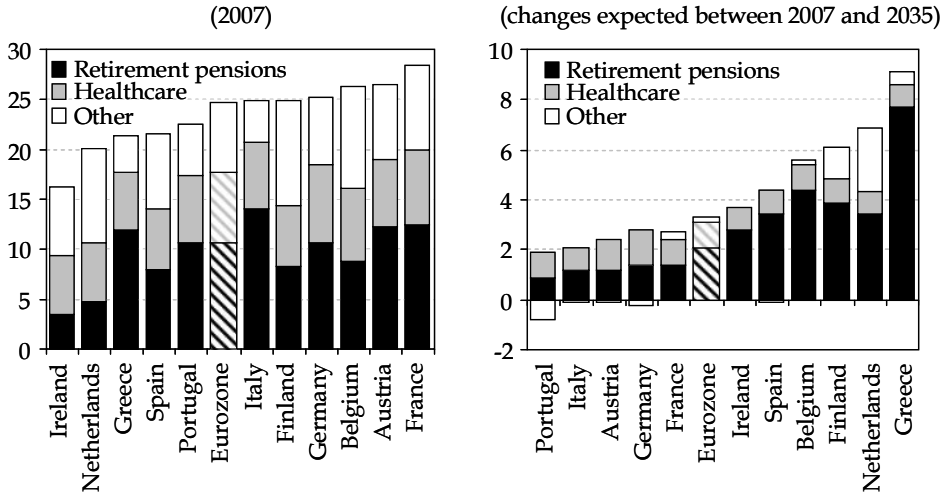


Source: OECD.

The features that clearly distinguished the public finances of the eurozone from those of the United States and Japan were the size and the nature of the budgets concerned. Taking the average for the period 1999-2006, public spending was equivalent to almost 50% of GDP in the

eurozone, compared with slightly less than 40% for Japan and around 35% for the United States. For the most part, this difference was explained by a much higher level of social spending in the eurozone, *on average half as much again* as in the United States, with the difference due not so much to healthcare spending as to other social programmes, notably pensions and unemployment benefits.

Figure 27. Social spending in the eurozone (% of GDP)



Sources: OECD and European Commission.

Here again, there were wide differences among European countries. These were all the more worrying in that social spending is, as we have seen, the source of off-balance-sheet commitments, which population ageing and medical progress are liable to render particularly costly. In an exercise carried out in 2008, the European Commission [2009] calculated the amount of additional spending to be expected in future decades, assuming no changes in legislation. Taking the average of all the eurozone countries, the ratio of this spending to GDP was expected because of ageing to rise by more than 3 points by 2035 (slightly less than the corresponding figure mentioned earlier for the United States), with most of the increase explained by greater spending on pensions. Here too, however, there were significant differences among countries, with the addition amounting to

roughly 4 GDP points in Ireland and Spain, 6 points in Belgium, Finland and the Netherlands and more than 9 points in Greece⁹ (Figure 27).

Longstanding neglect of fiscal discipline

Aware of the potential for destabilisation related to possible disequilibria in their public finances, the countries signing the Maastricht Treaty had made arrangements aimed at ensuring a minimum of fiscal discipline. For example, in Article 104B, the Treaty specified that each country would remain solely responsible for its debts. This principle was later erroneously interpreted as a ban on governments providing financial aid to each other [Pisani-Ferry, 2011]. In order to give its full weight to this responsibility, the Treaty also specified (Article 104) that the Central Bank could not directly finance participating governments through overdraft facilities or any other type of credit, while “the purchase directly... of debt instruments” was also forbidden. On top of these general principles, there were also certain numerical criteria to be respected in order to be able to join the single currency: a budget deficit of less than 3% of GDP and gross debt not exceeding 60% of GDP (if the figure were higher, it had to have “declined substantially and continuously”).

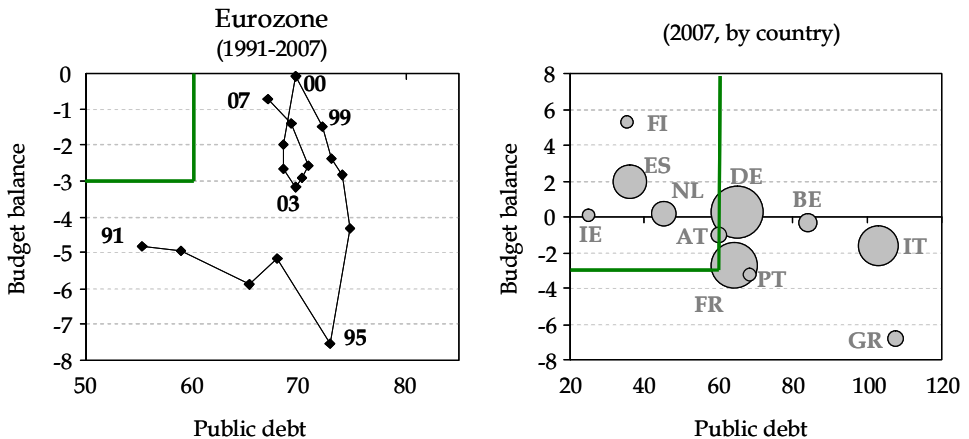
The years preceding the creation of the single currency therefore saw impressive reductions (in the direction of the stipulated threshold) in the public deficits of candidate countries, while at the same time their public debt ratios were stabilising or declining. Once having joined the single currency, participating governments were called on to observe the rules laid down in the Stability and Growth Pact, which combined these same criteria with arrangements for their monitoring. Its ineffectiveness soon became apparent: the “excessive deficit procedure” was difficult to implement in the case of the large countries and the European Commission’s constraining powers were weak, regardless of country size.

Excessive deficit procedures were launched against Portugal and Germany at the end of 2002, against France at the beginning of 2003 and then against the Netherlands in the spring of 2004. All were subsequently abandoned. Only in the case of Greece, against which a similar procedure was initiated in May 2004 (mainly because of the authorities’ incapacity to provide reliable budget data) was the result, in 2005, a formal notice of

⁹ These figures have obviously been dramatically altered by reforms decided in the following years, in particular in the wake of the sovereign debt crisis.

proceedings. Having shown itself impotent to ensure observance of the letter of the Pact, the Commission had even less success in imposing its spirit. In order to be able in periods of slowdown to make use of the budget to underpin activity, a country should normally take advantage of upswing periods in order to consolidate its finances. Until the mid-2000s, however, few countries in fact did so and in 2005 the prevailing rules were relaxed (notably by broadening the notion of 'exceptional occurrences').

Figure 28. Evolutions in public balances and public debt in the eurozone and the Maastricht criteria (% of GDP)



Note: In the diagram on the right, the areas of the circles are proportional to the countries' nominal GDPs.

Source: OECD.

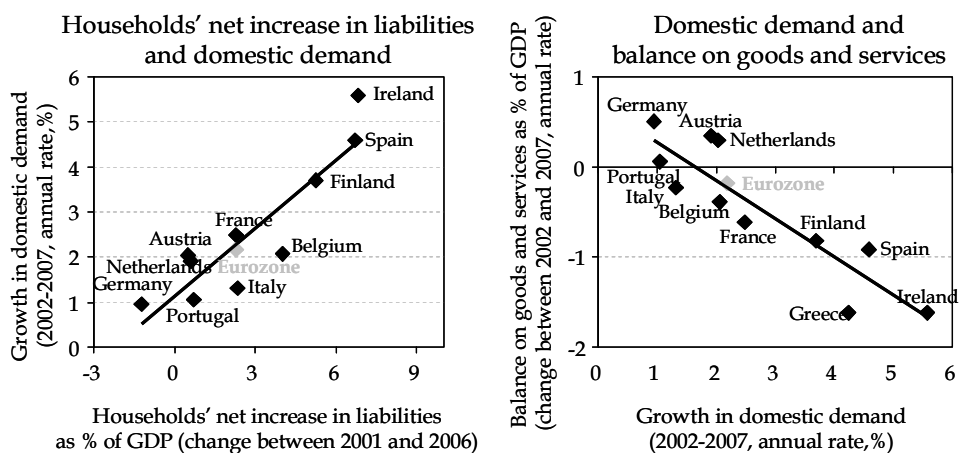
Figure 28 summarises these various episodes, taking the eurozone as a whole. Despite a relative lack of fiscal discipline, its public deficit in 2007, when the financial crisis broke out, was less than one GDP point and its public debt ratio, close to 65% of GDP, had fallen by 10 points in the space of a decade. This positive observation, all things considered, has to be complemented by one that is less positive. While certain countries had clearly been respecting the Maastricht criteria, this was only approximately true of the two largest, France and Germany, while Greece was a long way from observance – to judge by the currently available figures, at least. In the summer of 2007, the Commission, on being told that the public deficit had fallen from 8% of GDP in 2004 to 2.6% in 2006, had suspended the procedure initiated against the country. It now turns out that the true figure for the Greek deficit at the time was in excess of 6% of GDP!

The unexpected divergence in financial behaviour of private agents

What the signatories to the Treaty saw less clearly – and even less attempted to contain – was the potential for destabilisation related to the implementation of a single monetary policy in a zone where there was still a high degree of financial heterogeneity. The same monetary policy can in fact lead to evolutions in private borrowing that differ widely from one country to another. This will be the case, as has often been highlighted, if expected inflation rates lead to considerable divergences in real interest rates as perceived by economic agents. It will also be the case, however, if financial practices remain different as between countries. This was precisely the situation in the years following the creation of the euro. While currency unification was accompanied by an integration of the markets in which the large firms find their finance, the same was not true of the retail banking sector, with the conditions for borrowing by households and small firms remaining national. This was especially true of mortgage lending, which is the main source of financing for households. For example, given the importance of variable-rate loans in Spain, the average apparent interest rate on Spanish households' outstanding mortgage debt fell between 2003 and 2004 by 100 basis points more than in Germany, where fixed-rate loans predominate.

On top of this difference in the evolution in the cost of borrowing, there was also the difference in the levels of indebtedness at the time of entry into the euro. In the latter half of the 1990s, private European agents, households in particular, were far from having a homogeneous 'financial past'. German and Dutch households already owed substantial debt (100% and 120% of disposable income, respectively). Meanwhile, Spanish households were carrying relatively little debt (barely more than 50% of income – like French households, in fact). This raft of differences led to substantial divergences in behaviour throughout the period preceding the financial crisis. Divergences in the pace of borrowing by households explain, during this period, much of the divergences in the growth rates of domestic demand. Given that European countries are commercially wide open to one another, the evolutions in their current-account balances largely reflected the different rates of growth in their domestic demand. While Germany during this period posted an improvement in its current-account balance, this was in large part because its domestic demand grew more slowly than those of all the other eurozone countries. Meanwhile, those of Spain, Ireland and Greece were growing faster than the rest (Figure 29).

Figure 29. Household net increase in liabilities, domestic demand and balance on goods and services in the eurozone, 2002-07



Sources: Eurostat, Thomson Datastream and authors' own calculations.

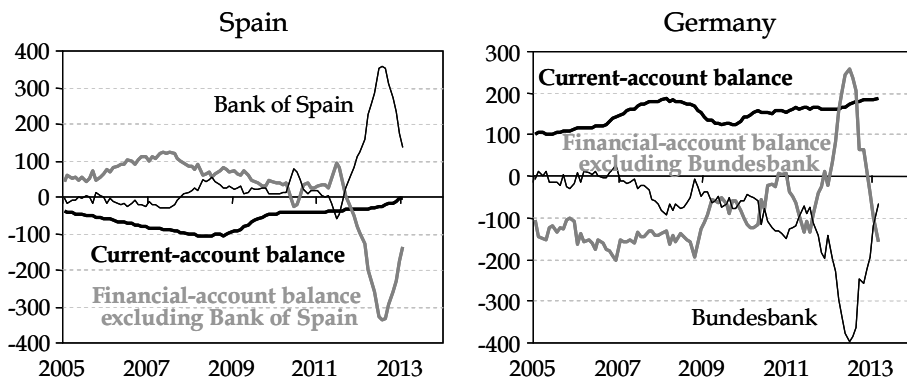
From the beginning of the 2000s, therefore, the pattern of transfers of savings between eurozone countries was based on the same considerations as those governing such transfers at world level. For example, as in China, households in Germany posted growth in their net lending (even though at the time the share of wages in GDP was falling). This was possible because elsewhere in Europe, notably in Spain and echoing the US experience, private borrowing was rising sufficiently fast to absorb the savings generated. The 2007-09 financial crisis then, as elsewhere, abruptly called this 'equilibrium' into question (Box 5). With private borrowing contracting violently, public borrowing then took up the running everywhere. In the space of two years, the public finances of eurozone countries deteriorated substantially (although generally less than in the United States or Japan). At the end of 2009, the public debt/GDP ratio had risen on average by almost 15 points and the budget deficit ratio from 1% to 6%. Certain countries, i.e. those where private borrowing had increased most or whose budget situations had already deteriorated, nevertheless found themselves in a much more disturbing situation. Ireland and Spain were violently ejected from the good-pupil group to which they had previously belonged (Figure 28), while Greece found itself even more remotely excluded, with its public debt close to 130% of GDP and its deficit 16%!

Box 5. Capital flows, Target 2 balances and current-account balances in the eurozone

Target 2, which replaced Target* in 2008, is a system enabling banks in the eurozone to carry out large-scale payments among themselves. It is based on a common platform constructed and managed on behalf of the Eurosystem by three central banks, Banque de France, Bundesbank and Banca d'Italia. The principle is relatively simple. When, for example, a Spanish commercial bank transfers funds to a German commercial bank, the Bundesbank credits the account of the German bank in its books and the Bank of Spain debits the account of the Spanish bank. Simultaneously, the Bundesbank acquires a claim on the ECB while the Bank of Spain incurs a debt to the ECB. The credits and debits of the national central banks are cleared at the level of the ECB: if the Spanish commercial banks make larger payments to the rest of the eurozone than they receive, the Bank of Spain will accumulate debts towards the ECB; if the German banks receive more than they pay, the Bundesbank will accumulate claims on the ECB. As long as the ECB provides the necessary liquidity through its refinancing operations, there are no limits on these balances. The amount of refinancing, for its part, is limited by that of the eligible collateral at the banks' disposal, however. The ECB has lengthened the list of this collateral and, by engaging in Emergency Lending Assistance (ELA), some national central banks have lengthened the list still further.

Figure 30 illustrates, for two countries, the key role played by Target and the Eurosystem. In pre-crisis Spain, the private net capital inflows – bank credit, direct and portfolio investment – were sufficient to cover the deficit on goods and services account. Once the crisis broke out in May 2010, and despite the reduction seen in the current-account balance, these capital inflows became insufficient or even – in the case of interbank flows, notably – reversed direction. The Bank of Spain's debit balance in Target then took over, so that in July 2010 the Bank had a 'Target debt' of around €100 billion. A second and more dramatic episode started in May 2011: the fear of a break-up of the euro induced a sharp reversal of portfolio and, above all, interbank flows. In August 2012, the Bank of Spain's liabilities vis-à-vis the ECB reached €430 billion. Conversely, the German banks were meanwhile benefiting from an inflow of deposits and were less inclined to lend directly to banks in the peripheral countries, so that German net private capital outflows were replaced by an accumulation of 'Target claims' – amounting to more than €760 billion in August 2012 – on the asset side of the Bundesbank's balance sheet.

Figure 30. Spanish and German payments balances, 2005-13 (€ billion, 12-month cumulative net flows)



Sources: Banco de España and Bundesbank.

In this way, the Eurosystem has enabled banks in the peripheral countries to avoid a liquidity crisis of the kind seen, for example, during the Asian crisis, at the cost, however, of increasing Target imbalances. This phenomenon, highlighted by Sinn & Wollmershäuser [2011], has been a source of controversy, notably concerning the risks involved for the Bundesbank. In fact, losses related to the functioning of the Target system would normally be distributed among all the participating central banks according to a set scale, independent of their balances in the system. Were the eurozone to break up, however, things would become more uncertain...

* Target is the acronym for Trans-European Automated Real-time Gross Settlement Express Transfer system.

5.2 A devilish spiral

At the end of 2009, in the aftermath of the financial shock, the budgets of the eurozone countries, like those of most other developed countries, were on an unsustainable path. In the absence of an improvement in their primary balances, public debt ratios were set to continue to rise. This situation was not dramatic in itself. In order to stem this rise by 2015, the eurozone, taken as a whole, would have had to reduce its primary deficit by around 4 GDP points, half as much as in the case of the United States (Figure 5). Spread over 5 or 6 years, this consolidation effort need not have curbed growth excessively. For example, simply by allowing their primary

spending to rise slightly less quickly than their nominal GDP, countries in the eurozone could, on average, practically achieve the effort required.

Spreading the consolidation effort in this way would obviously not have been without risk. For one thing, during this time the debt ratio would continue to rise and, for those countries starting from an already high level of debt, such a rise could be cause for concern, especially if the effort having to be made exceeded the average. Moreover, on the bond markets, the borrowing is not by the 'average' of the eurozone, but by the individual participating countries: the rules members had imposed on themselves made each of them vulnerable to doubts regarding its creditworthiness. No public authority was in charge or capable of withstanding pressures originating on the sovereign debt market. This situation had in fact been deliberately created because market pressure had been seen as one of the forces capable of imposing fiscal discipline on governments.

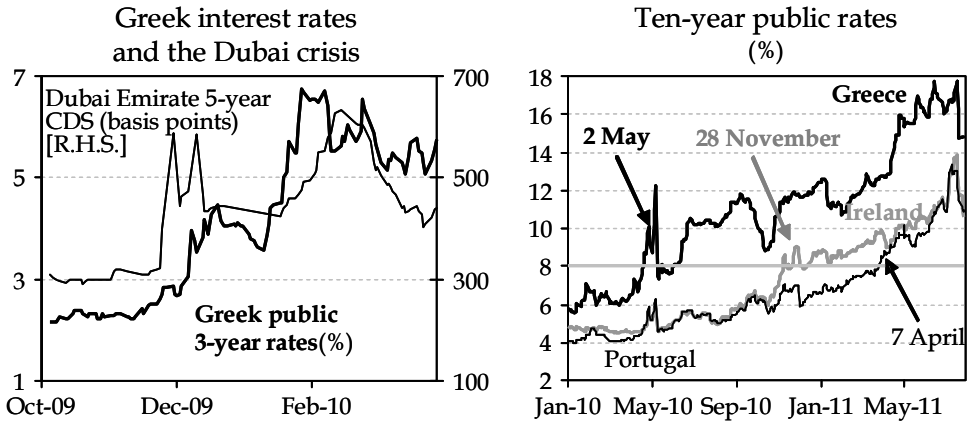
First, a Greek crisis

This vision was unrealistic, however. The bond markets, far from having the clairvoyance they are often credited with, are, like the equity markets, short-sighted and pusillanimous [Brender & Pisani, 2001]. The way in which the eurozone drama was triggered off was yet another demonstration of this point. In the autumn of 2009, despite the fact that the deplorable state of Greek finances had been made clear for all to see by a sharp upward revision in the public deficit, Greece was still borrowing at interest rates barely higher than those paid by other European countries. The attitude of the markets towards sovereign risk was then suddenly changed by an external event. At the end of November, the Dubai Emirate let it be known that it might request the restructuring of a debt it had guaranteed.

The idea that the debt of a member of a union of rich countries (the United Arab Emirates) might be restructured led to a radical change in the mindset of market operators, so that in just a few days Greek 10-year borrowing rates rose by 100 basis points. A rise on this scale, if sustained, would be sufficient to add more than one GDP point to the effort – already well above 10 GDP points – that Greece had to make to stabilise its debt ratio. This being so, Greek borrowing rates rose further, putting the effort needed simply to stabilise the debt burden that much more out of reach. At the same time, it increased the marked-to-market losses of those holding Greek securities. At the end of January 2010, despite the announcement of

ambitious austerity packages, Greek five-year rates came close to 7% (Figure 31), a rate at which further borrowing would rapidly become suicidal.

Figure 31. Public interest rate contagion in the eurozone



Sources: Thomson Datastream and Bloomberg.

The choice facing eurozone participants was then a simple one. If Greek debt was no longer sustainable, allowing Greece to default could be a logical solution. However, it would have serious implications. Since the Second World War, no developed country had ever defaulted. In the eyes of markets whose reasoning is based largely on memory of the past, a default was therefore highly improbable. But if an event seen as improbable then in fact occurs, the probability of similar events occurring is revised upwards. This means that if Greece were to default, the perceived probability that countries in a similar situation would do the same would increase – and so would their borrowing rates. The perverse dynamic by which Greece found itself in the space of a few weeks cut off from market finance therefore would then threaten to affect Ireland, Portugal and even Spain, these being countries which, for various reasons, found themselves in a difficult situation. The risk was all the greater in that eurozone countries had no means of halting such a dynamic once launched. Neither the ECB nor the other eurozone countries can in normal circumstances buy the debt of a member state on the secondary market in order to stabilise its price.

Default was not the only possible solution, however. A programme of financial support could make it avoidable, with the other countries borrowing in order to lend to Greece the sums needed to repay its

maturing bonds but also to finance its substantial budget deficit. This solution, too, was not without its dangers. If the conditions attached to the aid were too favourable, Greece might be tempted to relax its efforts and other countries in difficulty could want to be similarly treated. If, on the other hand, the conditions were too tough – interest rate too high or budget consolidation effort too exacting – this could mean a deterioration in the growth prospects for the Greek economy and hence in the outlook for a return to sustainable levels of debt.

At the beginning of April 2010, a support package was finally put in place. European countries agreed to place some €30 billion at the disposal of the Greek government... if it asked for it. In the following days, Greek interest rates rose above 8% and on April 23rd the programme was activated. Being substantially insufficient, it was unable to prevent the continuing slump in Greek bond prices, which was accompanied by that of the bond prices of the two countries whose situations were currently looking most fragile, namely Ireland and Portugal. A few days later, there was the first of what would turn out to be a long series of European summit meetings. The aid package for Greece was raised to €110 billion, one-third of this to come from the IMF, and a new institution – the European Financial Stabilisation Facility (EFSF) – was created in order to finance, with the other member countries acting as guarantors, those which no longer had access to the market. The Facility's declared firepower was €440 billion, but it turned out a few days later that at first at least it would not be able to lend more than €250 billion at most.

And then a euro crisis

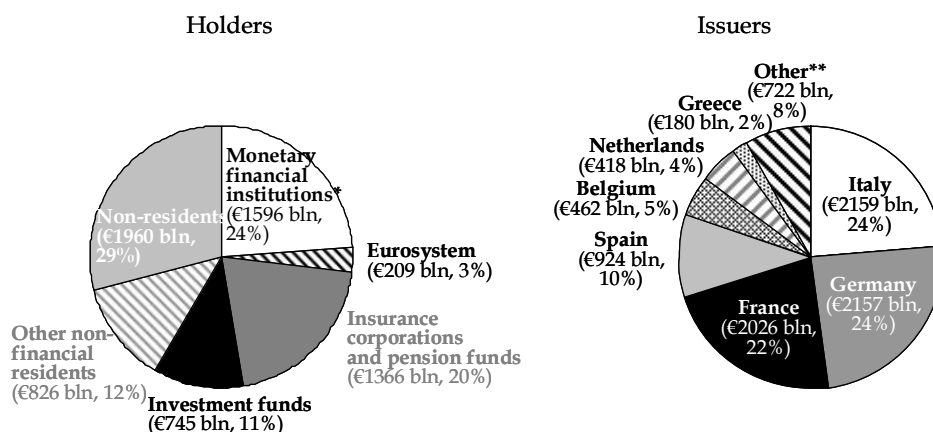
From the start therefore, the inherent defect in governments' response to the crisis then entering its acute phase became clear. They were attempting to implement aid programmes, not to stem a market dynamic (Box 6). To prevent the risk of moral hazard, the conditions on EFSF loans were, initially at least, tough, dissuading countries from taking them up as long as their access to the market was not completely blocked. In the meantime, however, prices of their debt securities would have collapsed, generating through a knock-on effect the erosion of prices of debt securities of governments seen to be in a similar situation – and losses for all the holders of those securities. Above all, not being authorised to buy securities on the secondary market, the EFSF was unable to intervene directly in order to nip market movements in the bud. In fact, governments implicitly left this task to the central bank.

Immediately after the May 2010 summit, taking as its pretext “the severe tensions in certain market segments which are hampering the monetary policy transmission mechanism”, the ECB launched a programme of purchases of public debt securities. In the space of a few weeks it purchased some €50 billion worth of Greek, Irish and Portuguese securities (slightly less than 10% of the outstanding amounts). But this action had to remain limited: even before it began, Axel Weber, President of the Deutsche Bundesbank, had expressed the opinion that such purchases did not form part of the Bank’s remit (he would resign from the ECB Governing Council a few weeks later).

Box 6. Speculation... or a simple market dynamic?

Identifying the nature of the forces that have in turn affected the bond markets of the various vulnerable countries makes it possible to understand why the European authorities have, for more than two years, been unable to stem this contagion. Public bonds issued by developed countries are normally held by the ‘collectors of long-term savings’ – insurance companies, pension funds, mutual funds, but also sovereign wealth funds – wanting to have on their balance sheets stocks that are relatively liquid, regarded as free of credit risk and carrying a fixed long-term interest rate. But public bonds are also held by banks and more generally ‘risk-takers’ (hedge funds, for example), which borrow short-term when money market rates are low in order to purchase stocks carrying a higher interest rate (Figure 32).

Figure 32. Holdings of eurozone public debt, by agent group, December 2012



* Money market funds are included in “monetary financial institutions” and not in “investment funds”.

** The “other” issuers of public debt are Austria (€249 billion), Portugal (€159 billion), Ireland (€117 billion), Finland (€110 billion), Slovakia (€42 billion), Slovenia (€20 billion), Cyprus (€12 billion), Malta (€6 billion) and Luxembourg (€6 billion).

Source: European Central Bank.

Now let us imagine that default on the part of the Greek government is no longer regarded as highly improbable. The more risk-averse collectors of savings and risk-takers will want to reduce their exposure and will sell part of their holdings. Fairly soon, however, certain risk-takers, noting that a downward trend has begun, will bet on its continuation, borrowing stocks in order to sell them or trading in derivative products such as Credit Default Swaps (CDS). The decline will then accelerate, prompting the collectors of long-term savings and the risk-takers into further selling. The movement will be all the more abrupt in that the collectors of liquid savings (deposit-rich banks, money market funds) will want to reduce their lending to the risk-takers holding Greek bonds, thus forcing them to reduce their positions, and so on. In this movement, speculation can act as accelerator, but the movement would take place even without it. It is the result of the sudden reassessment of the Greek risk by the financial system – finding as a whole that it is holding too much of it – and of the absence of a public authority prepared to buy the securities of which the private operators then become sellers. The only way of stemming the movement would have been to make the risk of default by the Greek government again improbable, with the other governments guaranteeing Greek debt unconditionally and for an unlimited amount. By not doing so, for fear of moral hazard and in order not to jeopardise their own budgets, European governments have allowed the Greek problem to contaminate other countries in vulnerable situations, notably Ireland and Portugal.

If the European countries are not *actually* guarantors of the debts of participants in the single currency, then default on the part of Ireland and Portugal can no longer be ruled out and the price of these countries’ debt securities will therefore start to fall. Collectors of savings, ‘once bitten’ by the experience with Greek securities, will reduce their positions even more rapidly, as will the risk-takers – all the more so as the banks, which constitute a substantial part of this group, will have increasing difficulties in finding the financing they need in order to preserve their positions. Unlike American banks, European banks are on average heavily dependent on the wholesale markets (interbank and bond) for their financing. Unfortunately, at the same time as the credit risk of each government was being reassessed, the aversion to risk of all operators in the financial system was increasing and the deposit-rich banks, especially the German banks, began to hesitate to lend to those they knew held stocks whose prices were falling (Box 5). In this way a market dynamic was launched that would rapidly affect Spain and then Italy and by end 2011 pose a threat to the totality of European countries.

It in fact constituted an archetypal example of *endogenous* risk, in other words, “a risk from shocks that are generated and amplified within the [financial] system” [Danielsson & Shin, 2002]. The only way to halt such a dynamic, as was seen back in 2008 following the failure of Lehman Brothers, is to help the financial system to regain stability by allowing it to eliminate part of the risk it is no longer able to bear [Brender & Pisani, 2009]. The ECB took such a step starting in May 2010. By purchasing the public debt securities of the countries that were most in jeopardy, it withdrew credit risk and liquidity risk from the system. The scale of its purchases nevertheless remained small (around €60 billion between May and July 2010 and €140 billion in the 2nd half of 2011). At end-2011, however, the nature of its interventions changed and it launched two large-scale *three-year* refinancing operations – in December and February – each worth almost €500 billion. This relieved the system of a large part of the liquidity risk it was no longer able to bear, but without at the same time relieving it of the credit risk on the securities refinanced in this way.

During the summer of 2012, the ECB went one step further and announced it would, under “strict and effective conditionality”, purchase, in secondary markets, sovereign bonds issued by eurozone member states asking to benefit from the programme. Known as Outright Monetary Transactions (OMT), the programme was ‘technically’ aimed at “safeguarding an appropriate monetary policy transmission and the singleness of the monetary policy”. In fact, it was a ‘deterrent’. With no *ex ante* limitation on the amounts purchased (although focused only on bonds with a maturity of between one and three years), the sheer possibility of an OMT intervention helped relieve tensions on sovereign bond markets. For the first time in the handling of the crisis, European authorities were using market dynamics to stabilise – and not to destabilise – markets!

The caution and hesitation shown by governments were perfectly understandable. They had to convince their taxpayers of the need to take the risk of having to pay their neighbours’ debts. Moreover, the sums involved were far from negligible. Full use of the EFSF would by itself have implied the transfer to German or to French taxpayers of credit risk amounting to roughly 8 GDP points. This caution and hesitation may have been understandable, but they nevertheless deprived governments’ response of much of its effectiveness and, as the months passed, the market dynamic continually grew in strength. In the wake of Greece, first Ireland and then Portugal asked the other countries for assistance.

In the spring of 2011, the crisis entered a new phase. The budgetary restrictions introduced in Greece, as part of the programme negotiated in the preceding year, led to a severe contraction in activity and the country’s

economic and social disorganisation was manifest. It became clear that Greece would not be able, as had been foreseen a year earlier, to return in mid-2012 to the markets for its financing. In order to meet its commitments after this date, it would therefore need additional public financing. The idea that the private sector could be asked to contribute to the financing of the government receiving assistance, by wiping out part of its claims, was then raised and introduced, in principle, in the draft treaty creating the European Stability Mechanism (ESM), which replaced the EFSF in mid-2012).

While the principle was logical, so was its impact on the market dynamic. By further strengthening the likelihood of seeing not only Greece but also the other assisted countries restructure their debt, it led to a further surge in Portuguese and Irish interest rates. Following the July 2011 summit meeting, the first occasion on which figures were given for the possible involvement of the private sector in the Greek case,¹⁰ Italian and Spanish interest rates soared and only a further wave of ECB purchases was able for a few weeks to curb the movement (although at the price of a further German resignation, that of Jürgen Stark, the Bank's chief economist).

Having failed collectively to stem the market dynamic - in many cases they even helped to stimulate it - governments had no other strategy than to attempt individually to make themselves less vulnerable to its effects. One by one, they decided to accelerate their return to budget equilibrium.

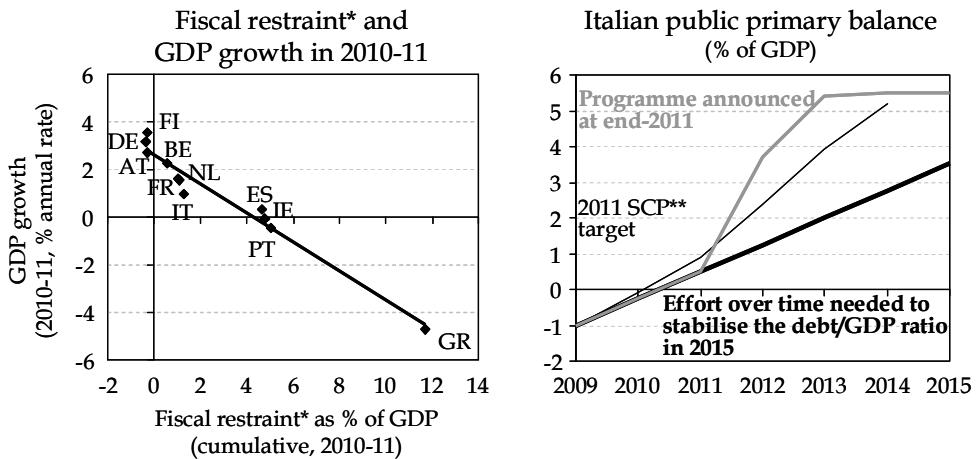
5.3 A dangerous strategy

As early as 2010, in order to put their public finances back on more sustainable paths, the European countries had decided to consolidate their budget situations. Regardless of the initial situation, most of them included

¹⁰ It took about a year for the private sector involvement (PSI) to be implemented: in March 2012, private debtors 'voluntarily' swapped their Greek public bonds for new securities taking a nominal haircut of more than 50%. The new securities were such that the loss in terms of net present value was close to 75%. This was putting the Greek deal on par with the 2005 Argentinean one. With one key difference: the amount exchanged this time (\$260 billion) was four times bigger! The fact that developed countries' sovereign debt is credit-risk free had clearly been challenged. In order to minimise the consequences, European authorities insisted that the Greek case would remain an exception.

return to budget equilibrium in 2015 in their Stability and Convergence Programmes (SCPs). The intensity of the efforts certain countries would have to make was considerable and the negative link between budgetary restrictions and growth rapidly became apparent (Figure 33). Taking the years 2010-11, there is a clear distinction between three groups of countries. In the first group, which includes Germany and France, the budgetary tightening was relatively moderate and growth remained reasonably firm. In the second group – Spain, Portugal and Ireland – the effort was significant and growth stagnated. Lastly, Greece made a budgetary effort of rare brutality (restriction amounting to more than 10 GDP points in just two years) and activity contracted sharply.

Figure 33. Fiscal efforts and growth in the eurozone



* Fiscal restraint is measured for this purpose as the change in the primary structural balance.

** Stability and Convergence Programme.

Sources: European Commission, IMF and Italian Treasury.

The impact of the European 'strategy' on growth was all the greater because of its generality. Within a monetary union, trade links are close and if all the members try at the same time to achieve a rapid return to budgetary equilibrium, the task of each individual becomes that much more difficult. Admittedly, Germany, which had substantial room for manoeuvre – achieving budgetary equilibrium could easily have been postponed by a few years (Box 7) – continued to stimulate its activity in 2010, but ceased doing so in 2011. Above all, from summer 2011 on, the slowdown in economic growth, the growing impact of the market dynamic,

as well as the pressure exerted by other governments and even by the ECB, led most countries, one after another, to post objectives whose ambitions were the greater, the more vulnerable they felt. Within a few months, Italy made substantial revisions in its primary surplus target. Starting from a situation close to equilibrium, it initially aimed at a *surplus* of 5.2% of GDP by 2014 but later decided that this should be attained as early as 2013. To stem the rise in its debt/GDP ratio, a surplus of 3.5 GDP points in 2015 would have been quite sufficient (Figure 33).

All in all, the European countries were induced to attempt budget consolidation on a much more ambitious scale than that initially envisaged. Being directly exposed to market pressures, governments had little by little not only accepted a strengthening of budgetary discipline and surveillance, but also set themselves the target of reducing their debt ratios. These commitments, taken at the time of the 'fiscal compact' agreed at the December 2011 summit, were regarded as sufficiently reassuring for the ECB to decide to launch a massive operation which, for the first time, was able to derail a market dynamic which until then had constantly been growing in strength. By enabling the banks to borrow from it *for three years* as much as they wished, the ECB substantially reduced their liquidity problem, thus eliminating one of the reasons that had been prompting them to sell public debt securities, namely the difficulty of financing their holdings (Box 6).

Following this resolute ECB action, the prices of peripheral government bonds were pushed upwards. Despite their audacity, these long-term refinancing operations (or LTROs), however, did not remove any credit risk from the markets. By mid-2012, it became clear that the accelerated fiscal tightening was stifling activity in Italy as well as in Spain and fears mounted that those two countries could follow a path similar to Greece. The prices of Spanish and Italian government bonds moved sharply down again. The more so since the idea that Greece could be forced out of the euro had been casually floated by some European officials in the weeks preceding the June Greek parliamentary elections: the spreads of peripheral-country bonds versus German ones were clearly no longer reflecting only credit risk but also redenomination risk. Were the euro to break up, the bonds those countries had issued would be redenominated in currencies that were bound to be weak!

The ECB felt compelled to act again. At the end of July 2012, Mario Draghi, its President, promised to do, within its mandate, "whatever it takes to preserve the euro". This was sufficient for Italian and Spanish

government bond rates that had just reached new highs to move significantly lower. The announcement of the details of the OMT in August (see Box 6) made them fall further. What made this moment a turning point of the crisis, however, was the fact that the German Chancellor took sides with the President of the ECB and against Jens Weidman, President of the Bundesbank, who had publicly opposed the programme. This convinced markets that a break-up of the euro was not as likely as many had thought. From then on, the virtual intervention tool the ECB had put in place has proved remarkably efficient: by mid-2013, Italian and Spanish rates were back to their pre-crisis level.

Box 7. What next for German public debt?

Between 2007 and 2010, the German budget balance moved from equilibrium to a deficit of more than 4% of GDP. At the same time, gross public debt in the Maastricht sense increased from 65% to almost 85% of GDP. This rise was due in part to the support amounting to 11 GDP points provided to the financial sector, notably the transfer of the assets of Hypo Real Estate to a public defeasance structure [IMF, 2011b]. Over the same period, net public debt therefore increased by slightly less than 10 GDP points, reaching a ratio of 52% in 2010. This rise, in a country with an ageing population, is a possible cause for concern. Much as in Japan, the share of the population aged over 65 is set to increase rapidly until 2035 before stabilising, while the share of the over-80s will even continue to increase until 2050. Also as in Japan, the nominal growth rate has constantly declined since the beginning of the 1990s, stabilising in this case at around 2%.

The problem facing Germany, like other developed countries, is first and foremost a medium-term problem linked to the upward drift in social spending. Between now and 2035, the rise in public pension and healthcare spending is expected to amount to more than 3 GDP points [European Commission, 2012]. Failing an effort to reduce this spending or to finance it, the debt/GDP ratio would rise continuously from 2025 on. To prevent Germany from falling into the 'Japanese trap' (low nominal growth and upward tendency in social spending), the Bundesrat on 12 June 2009, passed a constitutional amendment known as the 'debt brake', which in principle prohibits the government from voting through a budget showing a deficit. The law also provides for a progressive reduction, starting in 2011, in recourse to borrowing. In the absence of a natural catastrophe or "exceptional occurrences", the structural deficit of the federal government will not be allowed, starting in 2016 at the latest, to exceed 0.35% of GDP. A transitional period is granted to the Länder, whose budgets will not have to be in balance until 2020. This law has the merit of obliging the German authorities to make the effort needed to avoid a continuous rise in the debt ratio. However, it also provided the German government with an excuse to seek a rapid

rebalancing of its budget, a move that was far from obligatory in view of the situation of its finances...

Given that Germany was the reference country for the eurozone, delaying its return to budget equilibrium could in fact have enabled the other countries to take longer over their own return and thus avoid excessive restriction for all. The direction taken by Germany has obviously been very different: at the end of 2012, with structural net borrowing of just 0.31% of GDP, the federal government had already succeeded in complying with the 'debt brake'... four years earlier than prescribed by law!

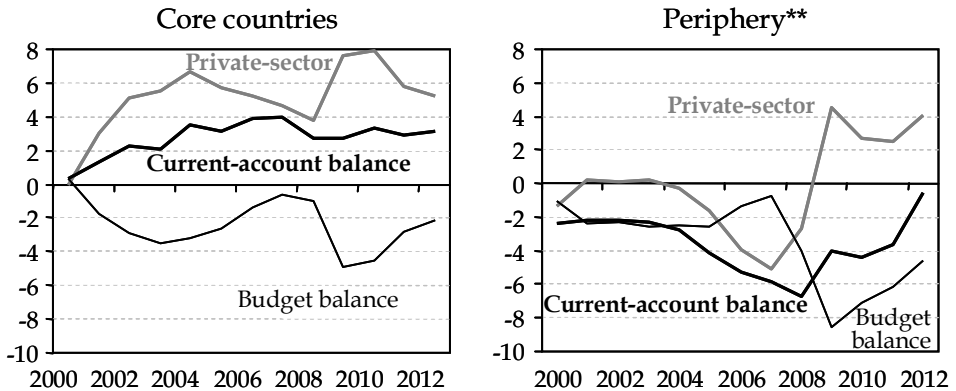
The return of the external constraint

By leaving it to the ECB to convince markets that the euro would remain intact and reducing the macroeconomic governance of the eurozone to a rapid rebalancing of budgets, governments have taken the risk of placing their economies on a dangerously weak growth path. As in the cases of Japan and the United States, the constraints which this rebalancing imposes on European growth can be analysed in the framework described in Chapter 2, with the recent period providing here a vivid illustration of their working.

The adjustments made to the fiscal targets of the Stability and Convergence Programmes since summer 2011 had put the public-deficit/GDP ratio of the eurozone on a very ambitious trajectory. But, with a private financial savings ratio falling only slowly, for the reasons already mentioned, such rebalancings of the public budgets were bound to lead to a sharp improvement in the eurozone's external balance. This in fact took place: in 2012 the eurozone's current account improved by more than €100 billion. This improvement was almost exclusively due to a reduction of the periphery's current account deficit, the rest of the area's surplus remaining roughly unchanged (Figure 34). The "higher than expected" fiscal multipliers that were associated with this evolution [Blanchard & Leigh, 2012, Box 1.1, p. 41] should not have come as a surprise. The budget rebalancing efforts of the peripheral countries were made at a time when the financial savings of their private sectors were remaining stubbornly high, instead of falling as many had predicted (or hoped!). Given the mediocre foreign environment in which these economies found themselves, and in some cases their mediocre competitiveness, a large part of the implied current-account improvement could only be achieved by a drop in imports and hence in domestic demand. By setting themselves fiscal targets that did not take account of the pace at which the spending behaviour of

the private sector could return to normal, eurozone governments had taken the risk of snuffing out the nascent recovery.

Figure 34. Net lending (-) or borrowing (+) in the eurozone, by sector, 2000-12 (% of area's GDP)*



* Governments' balances have been corrected for interventions to support financial institutions, notably in the form of bank recapitalisations. Private-sector balances have been adjusted accordingly.

** Peripheral countries consist of Italy, Spain, Greece, Portugal, Ireland, Slovak Republic, Slovenia, Cyprus, Estonia and Malta.

Sources: Eurostat, European Central Bank and authors' own calculations.

In the first months of 2013, some lessons of this dramatic episode seemed to have been drawn. It became accepted that by the end of the year many countries could miss the 3% deficit to GDP target that had initially been set: France was given two more years to reach it, Spain three more... Avoiding a further tightening of the fiscal screw at a time when cyclical forces are placing adverse pressure on the budget balance is of course positive. But by itself it will not be sufficient to pull the eurozone out of the stagnation in which it has become mired.

In all likelihood the decline in the private sector's financial savings ratio between now and 2017 will only partly compensate the targeted reduction in public deficits. The eurozone's current-account balance is hence set to improve further over the period, from a surplus of slightly more than 1% of GDP in 2012 to a surplus of around 2.5% in 2016. For this to be achieved – assuming the external environment to be the one expected by the IMF in April 2013 –, growth in domestic demand must remain weak and growth in activity will be unable to exceed an annual average rate of

1%. After five years of stagnation (from 2007-12), the eurozone would then have 'lost' almost a decade of growth and been confronted with acute social hardship.

Crude though it is, the calculation nevertheless shows the limitations of the strategy adopted. In the absence of a decline in the euro, the planned consolidation efforts condemn most of the countries in the eurozone to extremely weak growth, at best. In so doing, Europe will place itself in a position of great vulnerability. Not only will the growth rate of many countries be extremely dependent on the rest of the world but, for lack of adequate productive investment over many years, potential rates of growth are likely to decline... making it harder for public debts to be put on a sustainable trajectory.

If Europe wishes to avoid the risks of this stagnation scenario, it has little choice. After having recognised the unequivocal and generalised acceptance of budget discipline, it must now, as soon as possible, take on board all the implications of the solidarity that the euro has established *de facto* between its members. This implies not only the establishment of a banking union but also the strengthening of the tools required both to provide those that might need it with the necessary financial support and to master the market movements threatening all of them. It also implies using all the available room for manoeuvre to promote a growth-oriented strategy. Attempting to manage this change in close relation with the rest of the world is essential. This is because the crisis that the eurozone countries are going through is not a matter for them alone. Their banks occupy a central place in the globalised financial system, their governments' debts are a reserve asset for the whole of the world and their currency plays a pivotal role in the international monetary system.

6. THE INTERNATIONAL FINANCIAL AND MONETARY SYSTEM CAUGHT IN THE TURBULENCE

Sovereign debt issued by developed-country governments has until recently occupied a special place in the functioning of the 'globalised' financial system, namely that of a 'riskless' asset. If this debt now shifts, more or less gradually, from 'riskless' to 'risky' status without any change meanwhile in the investment behaviour of savers, the financial system's capacity for intermediation will be reduced. The problem will be even more real if this change takes place at a time when, as was the case at the beginning of the 2010s, financial agents' attitude towards risk is tending, either by a spontaneous reaction to past excesses or under the constraint of new regulations, to become more prudent.

The calling into question of the status of riskless asset accorded to public debt securities is obviously not yet general to all the developed countries. For the moment it has affected the debt only of certain eurozone countries. But the globalised financial system's capacity for intermediation has largely been based on banks in the eurozone. The reduction in their capacity for risk-taking is now imposing an additional constraint on macroeconomic equilibrium at world level. The global imbalances have to shrink not only because the economies that were running deficits on their current account cannot afford to do so any more but also because the risk-taking capacity of the global financial system has diminished. In this way, the sovereign debt crisis in the developed economies is affecting also the emerging economies that used to run surpluses, calling for an appreciation of their currencies accompanied by measures to support their domestic demand. Tighter international economic cooperation may hence be the only means of preventing the crisis from leading to currency turmoil and a prolonged slowdown in world growth.

6.1 Financial system, riskless assets and activity

The loss of riskless-asset status for some of the public debt securities of developed countries would have an even more significant impact on world growth if it takes place after a financial crisis which, for a time at least, makes financial regulators and operators more vigilant. In order to understand the mechanisms at work, a brief digression is necessary. It is important to recall the limits that a financial system's intermediation capacity – i.e. the mass of risks it is able to bear – imposes on the level of activity of the economy it serves. These limits, it will be shown in very summary fashion, are over and above those resulting merely from the interaction of the savings and investment behaviours of the non-financial agents.

Savings and risk-taking behaviours

Let us base our reasoning initially on a particularly simple closed economy functioning during only one period (Model 1). Financial intermediation is handled by the banks, households are the only savers and firms are the only agents borrowing and investing. The *savings behaviour* of households is summarised by the wealth they wish to hold when their income is that associated with the full employment of the available production capacity. The actual capacity utilisation – the level of activity – is determined by the size of firms' aggregate balance sheets. This size is constrained by the amount of available equity in that the equity-to-assets ratios of their balance sheets have to exceed a given minimum. The only assets on their balance sheets consist of the productive capital stock they are going to acquire and operate. Their liabilities, in addition to the equity, consist of bank loans and the bonds they have issued. The asset side of the banks' balance sheets comprises solely their loans to firms, while the liability side consists of deposits, bond issues and equity capital. As in the case of the firms, the size of the banks' balance sheets is constrained by the size of their equity capital.

The *risk-taking behaviour* of households consists of deciding the amount of shares and bonds they wish to hold when their income is that associated with full employment. The remainder of their wealth, placed on deposit with the banks, will depend on the amount of their actual income and will therefore be a function of the level of activity. For the economy to be at full employment, firms must have sufficient equity capital to be able to operate the entirety of the productive capital available and to borrow, either from the banks or on the bond market, the sums needed for its

acquisition. Their *investment behaviour* is encapsulated by the amount of capital stock acquired.

Model 1. Balance sheets of financial and non-financial agents

Non-financial corporations		Banks		Households	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
K	E^c		E^b	E	W
	B^c		B^b	B	
	L	L	DEP	DEP	

where K is the productive capital stock, E^b and E^c are the equities issued by the banks and the non-financial corporations, respectively, B^b and B^c are the bonds issued by the banks and the non-financial corporations, respectively, W is the household wealth, E is the equities held by households, B is the bonds held by households, DEP is the deposits by households and L is the loans made by banks to enterprises.

Now suppose households' savings behaviour to be such that, at full employment, they wish to hold wealth equal to the value of the capital stock available. If their aversion to risk is low, arriving at full employment can be a simple matter. This would be the case if households accept to place all their wealth in a risky form and directly hold the shares and bonds that firms have to issue in order to acquire and operate all the capital stock. Full employment can then be achieved for the economy without the intervention of financial intermediaries. However, this behaviour resembles more that of the capitalists of the 19th century than that of today's wage-earners/savers, who, being more prudent, are looking mainly for safe investments. In this case, full employment cannot be achieved in the absence of a financial system that takes on the risks that the savers do not take directly; the system is reduced here to the banks, whose attitude towards risk is defined by the prudential rules decided by them or imposed on them. Their capacity for taking credit risk is limited, as we have seen, by their equity ratio and their capacity for taking liquidity risk by a minimum ratio between their long-term resources – the shares and bonds they have issued – and their long-term assets (in this case, the total of their balance sheet, as their loans are assumed to be long-term). In all that follows, the interest-rate risk is ignored, for the sake of simplicity.

This simple framework makes it possible to highlight an important feature of a real-life economy, namely that the level of activity is constrained by the risks that the interplay of savers' behaviour and the

behaviour of the financial system makes it possible to bear (Box 8). If, given the prudence shown by the banks, the amount of shares and bonds that households are prepared to hold is not sufficient to enable firms to acquire and operate the totality of the capital stock, the economy will not be able to reach full employment *even when households' savings behaviour would make this possible* (recall that it has been assumed that the 'full employment' savings and investment ratios are equal).

The role played by prudential rules deserves a brief comment. The liquidity constraint will 'bite' if borrowers obtain their finance mainly at long term whereas savers invest mainly at short term. The more prudent the behaviour of the banks – the closer the amount of long-term loans granted remains to that of their long-term resources – the 'tougher' the liquidity constraint. The economy may then be in a state of under-employment not because borrowers are not prepared to borrow the entire amount that savers wish to save, but because the financial system and households, taken together, are unable or disinclined to bear the liquidity risk that this amount of borrowing implies. If one assumes household behaviour to be invariable, the economy can only be brought closer to full employment if the behaviour of the financial system – in this case, the banks – is made or becomes less prudent. The liquidity constraint will be lifted if the financial system lends (long-term) what is necessary to bring the economy to full employment by taking the risk of borrowing (short-term) the full amount necessary, in the form of deposits. A similar analysis can be made of the operation of the equity ratio: the lower the ratio desired – or required – the weaker the constraint imposed on activity.

There is one intriguing point here: if prudential rules can be relaxed in order to bring the economy close to full employment, this should always be attainable without difficulty. As the only holders of wealth, households are nevertheless also the only agents bearing, directly or indirectly, the totality of the risks associated with the functioning of the economy. If the financial system takes on an excessive degree of risk, its stability at any given moment can only be maintained with the help of an 'external' intervention, meaning that a public authority entrusted with ensuring financial stability – namely, the government – must take on the risks that the financial system is no longer capable of bearing. Its intervention will replace on the shoulders of households (the only source of tax revenue, in fact) the risks – and the possible losses – to which the imprudence of the financial system has exposed them.

Box 8. Risk-taking and level of activity

Balance sheets are those of Model 1. Household behaviour is rigid; the risks they are prepared to take are defined by the amount of equities and bonds they accept to hold *if their income corresponds to the full employment* of the available capital stock. What constraint does this behaviour impose, in conjunction with that of the financial system, on the level of activity, in this case the capital stock that can actually be exploited?

To operate an amount of productive capital K , firms must have at their disposal equity equivalent to $1/\alpha$ of this amount and borrow long-term from the banks the resources L they still need to acquire it. Banks have to respect an equity ratio, i.e. equity must be equivalent to $1/\beta$ of their outstanding debts. They are also subject to a liquidity constraint: their long-term resources ($E^b + B^b$) must be equivalent to $1/\gamma$ of their debts L . The constraints to which our agents are subjected can therefore be written as follows:

- for the non-financial enterprises: $K \leq \alpha E^c$;
- for the banks: $L \leq \beta E^b$ (capital constraint) and $L \leq \gamma(E^b + B^b)$ (liquidity constraint) with $\beta > \gamma$ and $\gamma > 1$.

What level of activity, defined by the amount of capital K being utilised, can this economy achieve at most? Let us suppose, first, that the banks' liquidity constraint is inoperative and that there are no bond issues. Let \tilde{E} be the amount of equities households are willing to hold: there is an allocation of equity between the banks and the firms that maximises the level of activity. To understand this, the simplest way is to reason successively on the basis of the balance sheets of these two agents. Let E^c and E^b be the respective equity of the enterprises and the banks (obviously, $\tilde{E} = E^c + E^b$). The amount of capital K that firms can utilise cannot exceed αE^c . To obtain it, they nevertheless need to borrow $(\alpha - 1)E^c$. To lend this sum, the banks must have at their disposal equity capital at least equal to $(\alpha - 1)E^c / \beta$. To make the most of the amount \tilde{E} of shares that households are prepared to purchase, the distribution of equity must then be such that:

$$\frac{E^c}{E^b} = \frac{\beta}{(\alpha - 1)}$$

The amount of capital that can then be utilised is:

$$\tilde{K} = \frac{\alpha\beta}{\alpha + \beta - 1} \tilde{E}$$

This is an increasing function of the amount of shares that households are prepared to hold and is higher than could be obtained in the absence of the banks (in which case, the maximum level of activity would be $K = \tilde{E} < \tilde{K}$).

Now let us suppose that bonds are issued and that the liquidity constraint comes into play. In order to explore the properties of the system, \bar{B} , the quantity of bond risk that households are prepared to take, is regarded as fixed. The maximum level of activity will vary solely as a function of the quantity of equity risk they are also prepared to bear.

When this quantity is low in relation to \bar{B} ($\tilde{E} < \frac{1}{\alpha-1}\bar{B}$), the maximum amount of capital that can be utilised is:

$$\tilde{K} = \alpha\tilde{E}$$

A portion of the bonds that households had been ready to hold cannot be issued and the presence of the banks does not make it possible to attain a level of activity higher than that attainable in their absence.

Let us assume that the quantity of equity risk accepted by households is now higher and such that $\frac{1}{\alpha-1}\bar{B} < \tilde{E} < \frac{\gamma(\alpha+\beta-1)}{(\beta-\gamma)(\alpha-1)}\bar{B}$. The banks' capital constraint is more difficult to satisfy than their liquidity constraint ($\beta E^b \leq \gamma(E^b + B^b)$). The maximum amount of capital that can be utilised now becomes:

$$\tilde{K}_{cap} = \frac{\alpha\gamma(\tilde{E} + \bar{B}) + \alpha\beta(\gamma-1)\tilde{E}}{\gamma(\alpha+\beta) - \beta}$$

This amount \tilde{K}_{cap} increases with the total quantity of risky assets $\tilde{E} + \bar{B}$ that households are prepared to hold and will increase with \tilde{E} . \tilde{K}_{cap} is also an increasing function of β : the more relaxed the banks' capital constraint (the higher the value of β), the larger the amount of capital utilised.

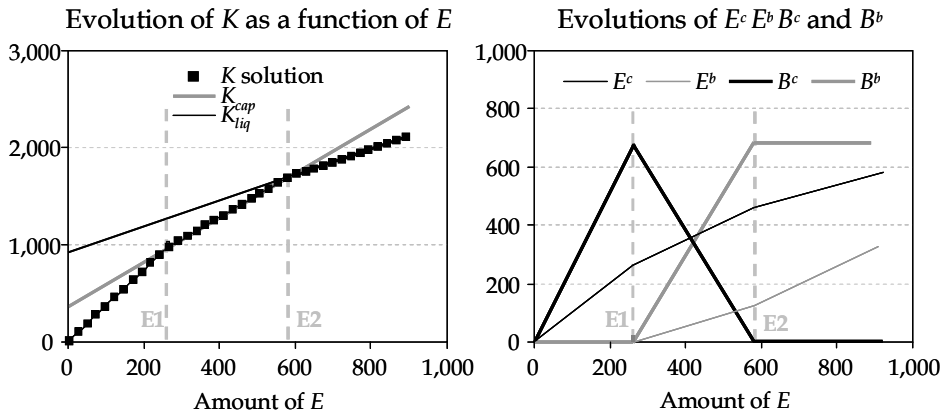
If households now accept an even higher equity risk, we have $\tilde{E} > \frac{\gamma(\alpha+\beta-1)}{(\beta-\gamma)(\alpha-1)}\bar{B}$ and the banks' liquidity constraint will become more difficult to meet than their capital constraint ($\gamma(E^b + B^b) \leq \beta E^b$). In order to ease to the maximum this liquidity constraint, the banks will mobilise all the bond placings ($B^b = \bar{B}$) and the capital utilised can be as much as:

$$\tilde{K}_{liq} = \frac{\alpha\gamma(\tilde{E} + \bar{B})}{\alpha + \gamma - 1}$$

This level depends only on the total amount of risky assets ($\tilde{E} + \bar{B}$) that households are prepared to acquire. It should be noted that it is higher than that attained previously. It is also an increasing function of γ : the more relaxed the banks' liquidity constraint (the higher the value of γ), the larger the capital stock that can be utilised.

Figure 35 illustrates these three cases: to the left of point E1, E is 'rare' in relation to \bar{B} , and the maximum level of activity K is that of an economy without banks. Between E1 and E2, the rise in E relaxes the capital constraint of the banks, which are able to issue bonds, and the attainable level of activity will rise fairly rapidly with E . Finally, if E exceeds E2, the liquidity constraint bites and the possible level of activity will continue to rise with E , but somewhat less rapidly than in the previous case, as all potential bond resources will have been mobilised by the banks.

Figure 35. Numerical illustration



taking $\alpha=3.7, \beta=10, \gamma=1.5, \bar{B}=700$.

Source: Authors' own calculations.

Let us now introduce public bonds B^g (Model 2). If these are regarded as riskless, the banks absorb them, if necessary, without difficulty and as a counterpart 'create' deposits. Their introduction does not modify the attainable level of activity. Things are different, however, if the public bonds are regarded as risky. If they have the same characteristics as the debt issued by enterprises, the liquidity and capital constraints in fact become: $L + B^g \leq \beta E^b$ and $L + B^g \leq \gamma(E^b + B^b)$.

Model 2. Balance sheets of private agents and government

Government		Non-financial corporations		Banks		Households	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
		K	E ^c		E ^b	E	W
Net present value	B ^g		B ^c	B ^g	B ^b	B	
			L	L	DEP	DEP	

The attainable levels of activity are then lower than in the previous cases. It can be shown, reasoning as before, that the capital stock that can be utilised is now, at best, depending on the values of \tilde{E} :

$$\tilde{K}'_{cap} = \frac{\alpha\gamma(\tilde{E} + \bar{B} - B^g) + \alpha\beta(\gamma - 1)\tilde{E}}{\gamma(\alpha + \beta) - \beta} \quad \text{or} \quad \tilde{K}'_{liq} = \frac{\alpha\gamma(\tilde{E} + \bar{B}) - \alpha B^g}{\alpha + \gamma - 1}$$

It can easily be seen that, assuming unchanged risk-taking behaviour on the part of households and banks, these levels of activity are below what they were previously.

Riskless stocks and risky stocks

Let us now introduce sovereign bonds, considered initially to be riskless. Because these bonds are safe and liquid, their holding by the financial system has no need to be subjected to the prudential rules applied to private securities. The existence of assets of this kind is particularly important for the management of macroeconomic equilibrium. To understand this, suppose that savers' behaviour is structurally deflationary – as seen in China or Japan, for example. At full employment, the desired savings ratio exceeds the economy's maximum investment ratio (corresponding here to the utilisation of the entire available capital stock). Because the economy still being postulated here is closed, full employment can only be achieved if public borrowing is added to borrowing by firms, as seen in the past two decades in Japan.

If the public securities are indeed riskless, this additional borrowing will not be a source of tension, however, even if the capacity of the system is saturated by the taking of the risks associated with private borrowing alone. By issuing public debt, the government will be providing the missing assets needed for savers' wealth to attain its full-employment level. And inasmuch as it is riskless (remembering that the interest-rate risk is ignored), this debt can always be held. If the savers – in this case the households – wish to hold this part of their wealth in the form of deposits, these will be created by the banks through the purchase of public securities.

This feature peculiar to public debt played a decisive role when, from 2009 on, developed-country governments borrowed in order to stabilise economic activity. This borrowing was the only means of absorbing the savings generated by the steep rise in private savings ratios. At a time when aversion to risk had become extreme, placing these government stocks posed no problem. Because they were seen as being riskless, the financial system absorbed this mass of stocks without constraint and 'created' in return the riskless forms of placement (deposits, in this case) demanded by the savers. The problem posed by the public debt stocks' loss of riskless status then becomes evident: by submitting the holding of public debt to the same prudential rules as private debt, *it eliminates a degree of freedom that is central to the management of macroeconomic equilibrium*. If public debt becomes a risky asset, government bonds will be in competition with private bonds for a place in savers' bond portfolios or on bank balance sheets. This means that full employment could become inaccessible (Box 8).

It is worth paying attention, in fact, to the modalities of this change in the status of public debt. Not only can it complicate the management of macroeconomic equilibrium, it can also threaten the very stability of the system. What would happen if savers and the financial system – reduced in this case to just the banks – were spontaneously and gradually to stop regarding public debt as a riskless asset? If, prior to the change, the constraints related to the taking of liquidity and credit risk were saturated, it might no longer be possible to continue holding the totality of the debt issued. For this not to be the case, it would be necessary for the banks to be able to increase their equity – so as to be able to make an upward adjustment in their capacity for taking credit risk – and also their bond issues – in order to bring their liquidity ratio back to its previous level. In the immediate aftermath of a confidence shock, such an additional taking of risk on the part of savers is unlikely. For the same reason, there is little likelihood that operators in the financial system would decide at this precise moment to apply less prudent rules.

There is therefore the risk of starting a destructive dynamic similar to that seen in 2007-09. This would be the manifestation, as on the earlier occasion, of an 'endogenous risk' (Box 6), with the financial system becoming destabilised to the point that only intervention by the central bank can provide a remedy. By increasing the size of its balance sheet, the central bank alone is capable of relieving private operators of a mass of credit risk and/or liquidity risk that they are no longer able to bear. The Federal Reserve did just this, starting at the end of 2008, by buying hundreds of billions of dollars' worth of securitised mortgage claims. The

ECB took similar action at the end of 2011: by financing for three years and for an unlimited amount the European banks, it relieved them in the space of three months of almost €1,000 billion of liquidity risk. Its Outright Monetary Transaction programme played a similar role. By saying it was ready – if needed – to buy an unlimited amount of debt issued by troubled member states, the ECB pre-emptively put a floor on the prices of their bonds and brought the system back into balance (Box 6).

6.2 A reduction in international financial intermediation capacity

By mid-2013, the loss of riskless status by sovereign debt securities was far from general. The fact that reputedly ‘riskless’ debt securities had in the Greek case ceased to be so nevertheless constituted a precedent, leading banks as well as other financial institutions to adopt a more prudent attitude with regard to the debt of governments in the eurozone. Nor is there anything to show that such a change might not start to take place in other regions. We have already seen that Japanese banks have built up increasingly large amounts of government securities in their balance sheets. However, there is an essential difference limiting the effects of such a change on financial stability in Japan in that the BoJ stands ready to purchase the stocks no longer being purchased by the banks or being sold by them. The same would be true of the United States – at least as long as the macroeconomic situation induces the central bank to want to maintain an accommodating monetary stance. Nevertheless, even if limited just to the eurozone countries, the loss of riskless-asset status for public debt is capable of affecting macroeconomic equilibrium at world level.

The international division of risk-taking

To understand how this operates, take the case of the closed-economy model used earlier to represent the world economy in the years prior to the 2007-09 crisis. The borrowers are the households and firms in the deficit countries, while the savers are the households and firms in the surplus countries. The former, borrowing essentially long-term, were a source of credit and liquidity risk that the latter, in search of liquid and safe placements, failed to take on. Nevertheless, the world economy enjoyed a high level of activity during these years because the globalised financial system – represented, in our modelling, by the banks – took on the liquidity and credit risk involved. In reality, the system comprised banks in different economies and also various other financial agents (insurance companies, investment banks, hedge funds, etc.) whose behaviour was governed by a

wide variety of prudential rules. The manner in which the risks related to international transfers of savings in the 2000s were taken on by these operators deserves attention. The roles played by individual groups were far from identical.

Contrary to what one might have expected, inasmuch as a large part of the savings transferred was used to finance American private borrowing, American banks did not in fact 'overburden' themselves with credit risk (the only type that can easily be measured using macroeconomic data). Far from deteriorating, their equity ratios in fact improved until the end of the 2000s. Even so, on the eve of the financial crisis, the United States had 'placed at the disposal' of *the rest of the world* a substantial net amount of non-risky assets: between 1998 and 2007, this rose from around \$1,000 billion to around \$4,000 billion (Figure 36). At the same time, additional domestic demand for \$8,000 billion of riskless assets was also satisfied. Given that the issue of riskless securities by the American public sector rose by \$4,000 billion, this meant that the total credit risk absorbed by the American financial system rose by more than \$7,000 billion over the period!

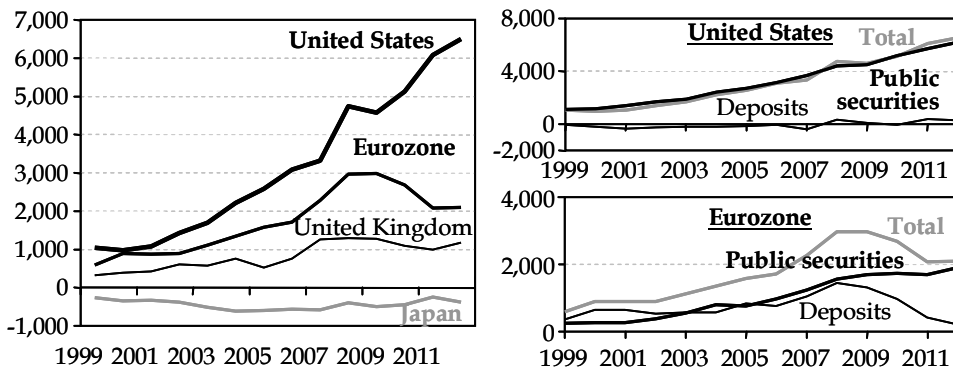
The risk carried by deposit institutions doubled, but so did their equity capital. This was not the case, however, for operators in the 'shadow banking system'. In their case, the mass of credit risk taken on was multiplied by more than 2.5, but without any matching rise in their equity capital. This was the case in particular of the securitisation agencies – Fannie Mae and Freddie Mac – which have since been placed under conservatorship. This imprudence, made possible by the US Administration's blind confidence in the financial operators' capacity for self-regulation, contributed to the relaxation of the constraints that would otherwise have prevented international transfers of savings on such a scale [Brender & Pisani, 2009].

These operators in the American shadow banking system were by no means alone in making a significant contribution to this increase in risk-taking. A quick analysis of the eurozone's balance of payments [Gros et al., 2010] shows that it too took on a substantial portion of the risks of this type. Not having a current-account deficit to finance, the eurozone was not directly concerned by the international transfers of savings then taking place. It nevertheless played a central role in the functioning of the globalised financial system making these transfers possible. At the end of the 2000s, the eurozone had in fact placed at the disposal of the rest of the world 'safe' investments regarded as carrying no credit or liquidity risk (bank deposits or public debt securities) amounting to around \$3,000 billion

(Figure 36). It was just as if, taken as a whole, the eurozone had acted as a risk-taker borrowing short-term to finance the acquisition of risky assets, thus relieving the rest of the world of credit and liquidity risk that it would otherwise have had to bear.

Note that this position was radically different from that of Japan, which, in line notably with China, is a structural net purchaser of riskless assets. Note also that these positions in the “international division of risk-taking” were already in place at the end of the 1990s [Brender & Pisani, 2001]. The build-up of current-account disequilibria nevertheless gave them fresh importance.

Figure 36. Net issues of riskless assets in the principal financial systems, 1999-2012 (\$ billions)



Note: The net issue of riskless assets is calculated on the basis of data for net external positions supplemented as necessary by flow-of-funds data and the Treasury International Capital System. The principle is to regard as riskless public securities (or securities guaranteed by government-sponsored agencies) as well as bank deposits. The net issue is the difference between the country's riskless liabilities and riskless assets. For details of the calculations, see Gros et al. [2010].

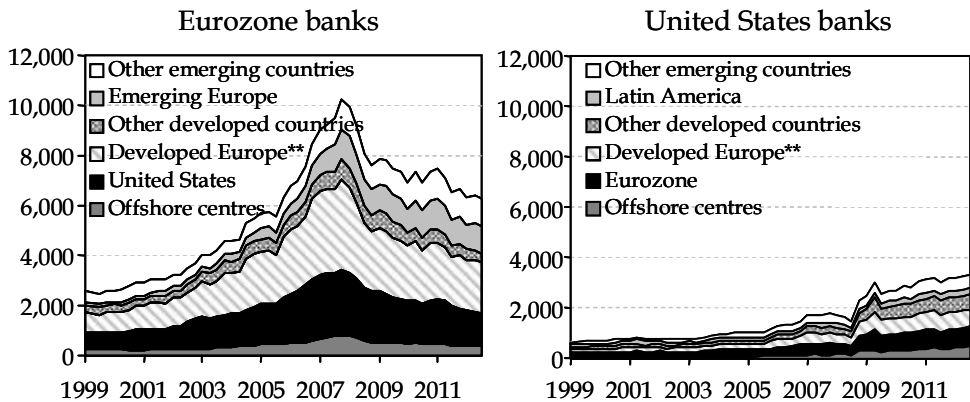
Sources: National central banks, US Treasury and authors' own calculations.

The central role played by European banks

These observations leave to one side an important dimension of this international division of risk-taking. They do not indicate the nature of the participating operators in each region. Data published by the Bank for International Settlements (BIS) make it possible to fill this gap, to a certain extent at least (Figure 37). They clearly show the central role played by the European banks and in particular those of the eurozone. Starting at the end

of the 1990s, these banks, unlike their American counterparts, considerably expanded their international activity. In 2007, their claims on the rest of the world amounted to almost \$10,000 billion, five times the corresponding figure for American banks.

Figure 37. Foreign claims of banks reporting to the BIS*, 1999-2012 (\$ billions)



* Consolidated statistics on an immediate borrower basis.

** Developed Europe excluding eurozone countries.

Sources: BIS and authors' own calculations.

Shin [2011], taking the analysis by Bertaut et al. [2011] a stage further, highlights in particular the absorption by eurozone banks of a large part of the credit and liquidity risk related to the private securitisation of mortgage lending (i.e. the part not guaranteed by Fannie Mae or Freddie Mac). To buy these claims and avoid taking an exchange risk, these banks borrowed huge amounts of dollars short-term in the United States, notably from money market funds. Contrary to what was seen in the case of the American banks, their risk-taking leverage (the ratio between the size of their balance sheets and their shareholder equity) increased considerably during these years.

Shin explains this contrast by the enthusiasm shown by European regulators – and bankers – for the provisions of Basel II: the use of internal evaluation models and the recourse to rating agency scores in order to provide the weighting of risks enabled European banks to uncouple the size of their balance sheets from the sum of their weighted assets (the former increasing distinctly more than the latter). In practice, they were applying prudential rules that were more permissive than those of the American banks. Like that of the operators in the shadow banking system, this imprudence on the part of European banks made possible the

absorption of a substantial portion of the risks generated by current-account imbalances at world level, but at the price of an excess of credit and liquidity risk-taking that the 2007-09 crisis then exposed.

And it is precisely these European banks, the cornerstone of the globalised financial system, that are now being affected by the public debt securities' loss of riskless status. The result is a decline in the system's capacity for risk-taking, due as much to the reduction in shareholder equity suffered by the banks as to the change in their behaviour. The rules they apply have become more prudent not only because of the new regulatory framework defined by Basel 3, but also on their own initiative. Having been imprudent for many years, they now have good reasons to be over-cautious as regards expanding their balance sheet. The threat to the world economy is clear. If banks from other regions do not rapidly step in to replace the European banks, the globalised financial system's capacity for intermediation will diminish and the possible scale of current-account disequilibria will find itself durably reduced.

This constraint could obviously be lessened if the 'demand' for intermediation generated by these disequilibria were to be reduced. This would be the case, for example, if the surplus countries were to take on – again, fairly rapidly – an increased portion of the risks associated with international transfers of savings. China seems willing to move in this direction, having announced at the end of 2011 that it wanted to use part of its foreign exchange reserves to finance two new funds, for a total of \$300 billion, intended for investment in American bonds and equities in one case, European bonds and equities in the other. By spring 2013, China's State Administration of Foreign Exchange was said to be studying the possibility of investing in US real estate, in order to diversify out of US government debt. The rate at which these investments will be made will show whether these measures can make a significant contribution to easing the constraint on the global risk-taking capacity.

Nor can it be ruled out that the deficit countries may issue less risky debt. Inasmuch as the only agent currently borrowing in the United States is the government, the situation is radically different from that prevailing throughout much of the 2000s. As long as US Treasury debt remains a riskless asset, the financing of its current-account deficit will not be constrained by the risk-taking capacity of the globalised financial system. This obviously cannot continue indefinitely, however. The moment doubts emerge concerning the creditworthiness of the American government, the situation could become explosive. Admittedly, the central bank will be

there to try to preserve financial stability, but downward pressures on the dollar could rapidly become irresistible and call, to be contained, for an international stabilisation effort.

The sovereign debt crisis, by affecting the globalised financial system's intermediation capacity, therefore imposes on the deficit developed economies a constraint that compounds the one already facing them domestically, obliging them to improve their external balance. However, it extends this constraint to deficit emerging regions – in Eastern Europe in particular – whose financing relies on the system. Given that one country's deficit is another country's surplus, the sovereign debt crisis will therefore act as a limitation in the coming years on the intensity of international financial disequilibria.

6.3 A threat to exchange rate stability

It is likely that the forces that are going to push down current-account disequilibria will be powerful. They are the result both of the reduced intermediation capacity of the international financial system and of the need for public and private agents in the large developed economies to make their indebtedness sustainable. However, for the United States and Japan, as for the European countries, a rapid consolidation of budget balances and the maintenance of adequate growth are, as we have seen, compatible only in a world environment where growth is relatively firm and at the cost of depreciation in their real exchange rates.

Admittedly, the priorities and the most pressing needs are not the same in all cases. Europe has opted for accelerated budgetary consolidation, and a rapid fall in the euro would enable it to avoid too prolonged a stagnation of activity. However, neither the United States nor Japan can allow its currency to appreciate substantially against the euro. Such an appreciation would in fact oblige these countries – which have given priority to a return to growth – to delay still further the consolidation of their budget and place their public debt on a trajectory that would be increasingly difficult to keep under control. In 2011 Japan in fact resumed its interventions on the foreign exchange market in order to stem the increasingly worrying rise in the yen and towards the end of 2012 the mere announcement of a radical change in the way Japanese monetary policy will be run triggered a sharp fall of the currency.

Are the real exchange rates of the emerging economies set to appreciate?

Without the support of the emerging regions, the developed economies are going to have difficulty in maintaining a growth rate sufficient to absorb the potential rise in unemployment generated by the crisis while at the same time avoiding a 'currency war'. The mechanism that could enable these economies, *taken together*, to improve their current-account surplus is in fact the same as that already described for each of them taken individually. It involves the highest possible growth in the demand from their trading partners – in this case, the emerging countries – combined with a depreciation in their exchange rate vis-à-vis these same partners.

The corollary, namely an appreciation in the exchange rates of the emerging regions, would not necessarily be objectionable; between the beginning of the 1980s and the beginning of the 2000s, these countries, with the notable exception of those in emerging Europe, have managed to correct a relative overvaluation of their currencies and this correction explains, in part at least, the rise in their current-account surpluses [Brender & Pisani, 2010]. The fact that these surpluses are now turning out to be unsustainable shows that this correction was excessive. Nor would its reversal through an appreciation in their real exchange rate necessarily be dramatic for the emerging regions. Part of this appreciation could take place gradually via the inflation differentials between them and the developed regions. For the rest, relatively moderate nominal movements could be sufficient, in that the emerging regions have become increasingly important trading partners for the developed regions.

This is clearly illustrated by the case of the United States. The share of emerging regions in the country's trade is now 55%, compared with less than 30% in the mid-1980s. The share of China alone has risen from 2% to 20%, distinctly higher than that of Japan or Canada and even higher than that of the eurozone. This increased importance of the emerging regions is a factor facilitating a fall in the dollar's real exchange rate. If, as the IMF was predicting in April 2013, inflation in the Latin American and emerging Asian countries is set to be higher over the next five years than in the United States – by 3.2 and 2 percentage points, respectively – these differentials will be sufficient, everything else remaining equal, to bring the dollar's real effective exchange rate down by some 6% by 2018. A nominal appreciation of the emerging Asian currencies amounting to 4% a year between 2013 and 2018 – a rate close to that posted by the Chinese currency since mid-2005 – would provide an additional 7% depreciation for the

dollar and this, combined with the inflation differentials, would bring the decline in its real exchange rate to 13%. This fall is close to the one calculated in Chapter 4 as being needed to bring the public deficit down to 3.5% of GDP in 2016 and at the same time bring the unemployment rate back to 6%. On the same assumptions, and recalling that inflation in emerging Europe is set to be 2 points higher than in the eurozone and that inflation in the eurozone is expected to be half a point weaker than in the US, the euro's real exchange rate would fall by close to 10%.

An appreciation in the real exchange rate of the emerging economies would therefore facilitate the developed countries' adjustment. Even if only gradual, it would nevertheless reduce the support that demand from the developed countries has so far provided for growth in the emerging economies. For them to avoid a backlash, their domestic demand must therefore grow more rapidly. This is now the explicit objective of the policies being implemented in many emerging economies. None of the evolutions needed for restoring balance to the world economy seems out of reach, therefore. Without agreed cooperation between emerging and developed regions, however, the world economy will have difficulty in keeping to the narrow path on which it must now set out.

The euro/dollar exchange rate in a state of precarious equilibrium

A return to the cooperation framework sketched out in the aftermath of the 2007-09 financial crisis is all the more urgent in that the potential for destabilisation of the exchange rates of the major currencies, that of the dollar vis-à-vis the euro in particular, has increased. These two currencies are also those of the economies issuing the public securities that have become the preferred vehicle for the holding of international reserves. At the end of 2012, 85% of reserves were, as we have seen, held in this form, compared with close to 50% at the beginning of the 1980s. These reserves were composed of more than \$4,600 billion of securities issued by – or guaranteed by – the American government and of \$2,000 billion of public debt securities issued by eurozone countries. Increased doubts regarding the creditworthiness of these issues could then threaten the relative stability shown until now by the euro/dollar exchange rate.

Despite the financial turmoil seen in the winter of 2008, this rate continued to be largely responsive to expectations regarding *the relative evolutions in monetary policy* seen on the two sides of the Atlantic. Movements in this exchange rate have in fact tended in the direction determined by the intentions of the respective central banks (or at least the

intentions as perceived by the markets), thus favouring the transmission of their policies. When, for example, the markets had the feeling that the Federal Reserve wanted to stimulate activity more than the ECB, the dollar depreciated versus the euro, and vice versa (Box 9).

Box 9. The euro/dollar exchange rate

In order to analyse the evolution of the euro versus the dollar since 2005, a very simple equation can be formulated. This introduces an interest-rate differential as explanatory variable. To be more precise, it is posited, in accordance with Brender & Pisani [2010], that:

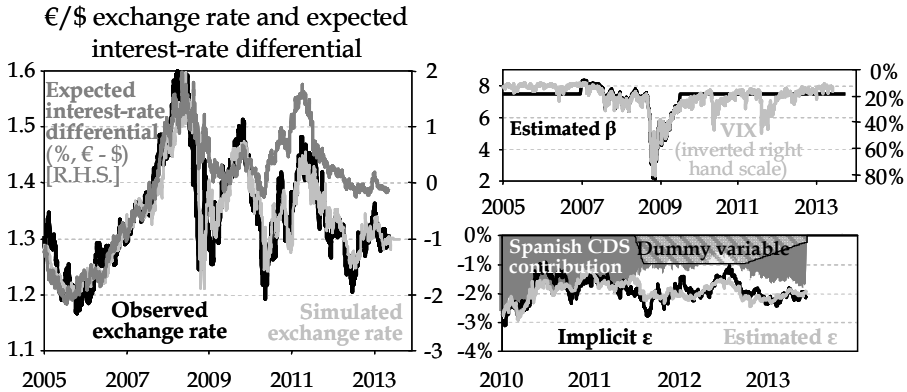
$$e_t = k(1 + r_t^e - r_t^s - \varepsilon)^\beta \quad (1)$$

where e_t is the exchange rate of the euro versus the dollar at time t (1 euro = e dollars), r_t^e is the three-month eurozone interest rate expected at time t to apply in a year's time (deduced from futures contracts), r_t^s is the American three-month interest rate expected at time t to apply in a year's time (deduced from futures contracts), ε is the expected annual rate of appreciation of the dollar versus the euro, assumed to be constant, β is the elasticity of the exchange rate to the expected yield differential (when β is low, aversion to risk is high and the exchange rate is relatively insensitive to expected yield differentials) and k is in this case a scale parameter.

In order to calibrate the equation, the first step was to carry out a regression of the exchange rate e on the interest-rate differential using daily data for the period January 2007-July 2008. Estimation of $\ln e_t = a + b(r_t^e - r_t^s)$ gives $\hat{a} = 0.34$ and $\hat{b} = 7.4$. Identification with the parameters of equation (1) gives $\beta = b$ and $\ln k - \beta\varepsilon = a$. The value of β used was 7.4 and, setting k arbitrarily at 1.12 (the purchasing power parity value of the early 2000s), we obtained $\varepsilon = -3\%$. The negative sign indicates that operators are expecting the dollar to fall. The amplitude of this fall is obviously a function of the value adopted for k , but for the calibration to remain compatible with the observed values of e and of the interest-rate differential, ε must be less than -2% .

Figure 38 illustrates the key role played during the period by the interest-rate differential. It nevertheless brings out an initial episode of 'unexplained' strength of the dollar during the 2008-09 crisis. This can be interpreted as a rise in aversion to risk (a decline in β) linked to the financial crisis. By estimating the elasticity β implied by the observed change in the dollar during this crisis, one finds (Figure 38) that it indeed reflects a sharp rise in the VIX (the volatility index of the American stock market), which is a commonly used indicator of aversion to risk.

Figure 38. Expected interest-rate differential, aversion to risk and euro/dollar exchange rate



Sources: Thomson Datastream and authors' own calculations.

From early 2010 on, the euro's exchange rate has again been below what could be explained simply by interest-rate differentials. However, this episode is of a very different nature from the previous one, as there was no major movement in the VIX on this occasion. One is therefore led to interpret it as a change in the regime of exchange-rate expectations, meaning that ε ceased to be constant. The intensification of the eurozone crisis weighed down expectations of the euro/dollar exchange rate. This can be verified in noting that with k and β constant, the value of ε needed to explain the observed evolutions in the exchange rate to a large extent fluctuated with the CDS of the Spanish government.

Starting at the end of 2009, a regression was made of this implicit value of parameter ε on this CDS and this estimation was introduced into the previously calibrated equation. Starting in the summer of 2011, this last equation, which again made it possible to simulate fairly faithfully the observed evolutions in the exchange rate, nevertheless leads to an overestimation of the weakness of the euro. The introduction of a dummy variable in order to make a downward correction in the estimated value of ε remedies this. This variable can be interpreted as a revision by the markets of the expected fall in the dollar. The date when this occurred (July 2011) coincided with the final phase of the debate regarding the raising of the US debt ceiling. To correctly capture the evolution of the euro/dollar exchange rate from end-December 2012 on, the role of this dummy has to be phased out progressively (Figure 38).

Whereas in the period after the beginning of the 2000s the fluctuations in the euro/dollar exchange rate largely reflected revisions in the expected level of interest-rate differentials, from the beginning of the 2010s on revisions in exchange-rate expectations have played a more important role. So far,

countervailing forces have prevented a speculative destabilisation of the euro or the dollar. However, if at some time in the future the eurozone crisis were to take on greater amplitude, there is a risk that expectations of a more profound decline in the euro might develop. Conversely, if at a subsequent stage doubts regarding the euro were to dissipate at the same time that the sustainability of US public debt was called into question, to a greater extent than at present, a substantial fall in the dollar would become possible. Mastering this potential instability can only be achieved through close cooperation between the authorities not only of the developed countries but of all countries, including the emerging ones.

Since the beginning of 2010, however, a different set of forces has been at work. In a first stage, the euro was relatively *weaker* than was justified simply by the evolution in expected interest rate differentials and its rate began to fluctuate in line with the intensity of the eurozone crisis. Taking into account from this time on an additional variable measuring this intensity, i.e. the CDS of a European country in a situation of 'intermediate' vulnerability, in fact makes it possible to understand the fluctuations in the euro versus the dollar, at least until the summer of 2011, when another major change occurred and the observed value of the euro became much *stronger* than that expected. This change took place in July 2011, at the time when the debate over the raising of the US debt ceiling was taking a dramatic turn. There is a temptation to interpret this as reflecting increased doubts over the sustainability of American public debt – and hence over the soundness of the dollar. From then on, the euro/dollar exchange rate began to fluctuate also in line with *the relative credibility of fiscal policies*. The fact that the euro weakened beginning of 2013 despite the sharp fall in the intensity of the euro crisis seems to illustrate this point. This improvement was indeed paralleled by an improvement in the US fiscal scene: falling off the 'fiscal cliff' had been avoided, while the return of growth had started to reduce the public deficit more than expected. The risk is that, at some time in the future, abrupt revisions in judgement may lead market operators and holders of exchange reserves to become sellers on a massive scale of one or other of the two currencies...

CONCLUSION

The crisis in the autumn of 2008, in a matter of days, made governments aware of the closeness of the links that financial globalisation had established, *de facto*, between their economies. For a few months, there was real cooperation between them. From one end to the other of the planet, stimulus programmes were put in place and the threat of an economic depression was averted. Once the immediate emergency had passed, international cooperation resumed its more usual formal character. Admittedly, the G20 continues to meet at regular intervals, but while its discussions still relate to the policies that each country should implement in order to help the world economy avoid the dangers facing it, there is generally little in the way of follow-up.

What the sovereign debt crisis is calling for is in fact greater coordination. This crisis has forced many governments in the developed economies to re-balance their budgets with more or less haste. Given that there is no reason to expect private borrowing to pick up at all rapidly, fiscal tightening is bound to reduce their borrowing from the rest of the world. If emerging regions and certain developed countries remain a potential source of excess savings, this will have a severe deflationary impact on the world economy. With governments of the developed countries borrowing less and less without their private agents borrowing more and more, how can the countries that used to accumulate current-account surpluses – the Asian countries and the oil-exporting states, in particular – be expected to go on doing so? The measures announced by the latter aimed at relying for their growth more on domestic demand will take time to operate. In the meantime, it would be in the general interest that the developed countries adjust the pace at which they reduce their budget deficits.

This assumes, of course, that indebted governments will be capable in due course of meeting their commitments. For most developed countries, a

further increase in public debt for some years to come should not in itself be cause for concern, provided that it is accompanied by a rationalisation of fiscal revenue and expenditure and also by the reforms needed to ensure the financing of social spending programmes in the coming decades. This would be the best guarantee they could give to those whose savings they will be absorbing, and far better than a precipitate return to fiscal equilibrium or its blinkered preservation. The western democracies have little choice: if they wish to continue to use fiscal policy as a tool of economic regulation, they have to learn to respect fiscal discipline *over the long term*. The sovereign debt crisis is a test of their maturity.

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