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Current Issues in Managing Government Debt and Assets

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Patrice Ollivaud

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CURRENT ISSUES IN MANAGING GOVERNMENT DEBT AND ASSETS

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By Łukasz Rawdanowicz, Eckhard Wurzel and Patrice Ollivaud

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ABSTRACT/RÉSUMÉ

Current Issues in Managing Government Debt and Assets

The management of government debt and assets has important implications for fiscal positions. Debt managers aim to secure non-interrupted funding at lowest medium-term costs subject to risks. Massive crisis-related increases in government debt in most OECD countries and increased risks on the asset side of government balance sheets may imply attaching a larger weight to avoiding risk than prior to the crisis, suggesting to extend debt maturities, possibly above pre-crisis levels. There are a number of trade-offs. Choices on the debt maturity structure interact with unconventional monetary policies. By driving down longer-term yields, the latter increase incentives to extend debt maturities which could counteract the initial monetary policy goal. High debt raises the temptation for eroding it via inflation, but the effectiveness of such policy seems to be limited and might be costly in the long run. Moreover, debt management needs to contribute to ensuring appropriate liquidity and functioning of government bond markets. Building financial assets can be appropriate for some purposes, such as prefunding future temporary spending or transferring wealth to future generations, but the risks are that accumulated funds might be used for current spending or tax reductions. In addition, assets might do little to hedge risks associated with debt servicing costs. Non-financial asset sales can help improve the fiscal situation, but purely revenue-driven privatisations without appropriate regulatory provisions addressing potential market failures should be avoided. Successful balance sheet management requires transparent, accurate and comprehensive measures of not only current but also future assets and liabilities.

JEL Codes: E6, H63, H81, H82.
Keywords: Public debt management, public debt, public assets, monetary policy, contingent liabilities.

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Problèmes actuels dans la gestion de la dette et des actifs gouvernementaux

La gestion de la dette et des actifs gouvernementaux a des implications importantes sur les situations budgétaires. Les gestionnaires de la dette ont pour but de sécuriser un financement ininterrompu au plus bas coût à moyen terme et en contrôlant les risques. Les augmentations massives de la dette publique liées à la crise dans la plupart des pays de l'OCDE ainsi que l'augmentation des risques sur les actifs du compte du patrimoine public peuvent se traduire par un poids plus élevé donné au contrôle des risques par rapport à la période antérieure à la crise, suggérant d'étendre le délai de remboursement des dettes, peut-être au dessus des niveaux prévalant avant la crise. Il y a un certain nombre d'arbitrages. Les choix sur la structure par échéance de la dette interagissent avec les politiques monétaires non conventionnelles. En réduisant les rendements à long terme, ces dernières accroissent les incitations à étendre le délai de remboursement des dettes ce qui peut neutraliser le but initial de la politique monétaire. Des niveaux élevés de dette accentuent la tentation de les éroder par de l'inflation, cependant l'efficacité de telle politique semble limitée et peut même être coûteuse sur le long terme. En outre, la gestion de la dette doit contribuer à assurer une liquidité appropriée et un bon fonctionnement des marchés d'obligations d'État. Développer des actifs financiers peut être adéquat dans certains cas, par exemple pour provisionner des dépenses temporaires futures, ou pour transférer de la richesse aux générations futures, mais le risque est que ces fonds accumulés soient utilisés pour des dépenses courantes ou pour baisser les impôts. De plus ces actifs ne vont sans doute pas permettre de se couvrir des risques associés au service de la dette. La vente des actifs non financiers peut améliorer la situation budgétaire, mais des privatisations uniquement orientées par la recherche de recettes sans dispositions réglementaires adaptées aux éventuelles défaillances des marchés doivent être évitées. Une gestion réussie du patrimoine public exige de la transparence ainsi que des mesures précises et complètes non seulement des actifs et passifs actuels mais aussi de leurs valeurs futures.

Codes JEL: E6, H63, H81, H82.
Mots Clés: Gestion de la dette publique, dette publique, actifs publiques, politique monétaire, engagements éventuels.

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CURRENT ISSUES IN MANAGING GOVERNMENT DEBT AND ASSETS

By

Łukasz Rawdanowicz, Eckhard Wurzel and Patrice Ollivaud[1]

1. In the wake of the financial crisis, government debt in the OECD area has increased massively on top of already high debt-GDP ratios prior to the crisis, by some 30% of GDP between 2007 and 2011 on average, rendering fiscal positions in many countries unsustainable. Management of government debt and assets can significantly contribute to limiting future risks to fiscal positions and support fiscal consolidation strategies. In this context, a number of policy trade-offs and conflicts have come to the fore:

- The maturity structure of balance sheets usually involves a trade-off between risk and cost. Inflated debt levels increase both the long-term fiscal costs of longer debt maturities and the magnitude of potential re-financing problems and costs. In practice most countries first shortened and then extended debt maturities since the onset of the Great Recession that has led to unprecedented low levels of both short and long-term interest rates.

- Choices on the debt maturity structure interact with quantitative and credit easing monetary policies. In particular, unconventional monetary policies that drive down longer-term yields increase the fiscal incentives to extend debt maturities but this could counteract the purpose of monetary policy. The flipside is that unconventional monetary policy can have non-negligible fiscal effects by affecting government funding costs and by putting risk on the central bank balance sheet.

- The size of the balance sheet also influences risk and return. Financial assets held at the same time as debt are effectively debt financed. It is not clear that a higher gearing would raise return and it might increase risk. On the other hand, the ability to liquidate assets might cushion against re-financing risks on the debt side.

- The crisis has led governments into taking more risk on the asset side, which raises the issue of how this must be matched on the debt side.

- Governments might issue securities of short maturity or indexed to inflation so as to signal commitment to keep inflation low, thereby reducing inflation risk premia (but possibly incurring liquidity premia to the extent markets for indexed debt are thin). In any case, given the current maturity structure of public debt, and in the absence of financial repression, there is limited scope to significantly reduce the real value of government liabilities with higher inflation.

- Few of the larger OECD countries issue foreign-currency denominated debt. However, while foreign-currency issues might broaden the investor base, they can raise the volatility of demand for government bonds.

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[1] The authors work on fiscal policy issues in the OECD Economics Department. We would like to thank Sven Blondal, Hans Blommestein, Jorgen Elmeskov, Sebastian Schich and Jean-Luc Schneider for valuable comments. Special thanks go to Isabelle Fakih for technical assistance.

2. Government balance sheet policies differ between countries, reflecting different market conditions and possibly suggesting differences in assessment of policy trade-offs and conflicts. In addition to the above trade-offs, a number of issues continue to shape balance sheet management:

- The composition of government liabilities and assets can be adjusted to reduce fluctuations in overall government revenues and spending in response to business cycles, which might help alleviate the need for discretionary adjustments in fiscal policy and associated negative long-term growth effects (*i.e.* allowing greater "tax smoothing").

- Liquid government bond markets aid in the pricing of private sector credit and derivatives and in providing liquidity buffers, regulatory capital and hedging assets to financial institutions.

- Financial reserves might be built for purposes such as prefunding future temporary spending or transferring wealth to future generations. However, there is a risk that funds will be used for current spending or tax reductions.

3. The remainder of this paper elaborates on the policy issues related to the management of government debt and assets in the context of significant consolidation needs in the OECD area. Rather than providing new theoretical or empirical research, the purpose is to highlight major trade-offs policy makers are facing and give some background to think about the various questions of immediate relevance listed above. Supplementary information that is relevant for the issues at stake on the structure of government debt, conditional liabilities and assets are provided in an annex.

1. Government balance sheet management

4. Government balance sheet management involves choosing the size and structure of government liabilities and assets to further public sector objectives subject to debt servicing costs, asset yields and risks. In particular, balance sheet management should minimise the risk that the government will not be able to service its obligations without unrealistically large adjustments in its revenues and expenditures. Management has to account for contingencies regarding spending, revenue and asset prices. Successful balance sheet management necessitates a large degree of fiscal transparency as well as accurate and comprehensive measures of not only current but also future assets and liabilities, including contingent ones (Box 1). In practice, debt and asset management is fragmented between the debt management office, public sector entities managing assets and the central bank, with potential conflicts between the different agencies' objectives. Information exchange between the relevant agencies is thus important for an effective management of all public assets and liabilities.

Box 1. Comprehensive and transparent reporting of liabilities and assets

A proper assessment of fiscal positions requires a comprehensive and transparent reporting of all public liabilities and assets carried out by an independent statistical agency. Fiscal transparency facilitates consolidation by lowering risk premia, minimising refinancing risks and limiting fiscal gimmickry. Fiscal reporting may involve a compromise: more comprehensive accounts are often more difficult to prepare, more complex and less internationally comparable. It is thus desirable that standard – often less comprehensive – balance-sheet measures are accompanied by broader measures of public sector balance sheets.[1] In this context, external auditing is important, and might be facilitated by fiscal councils.

Several conventional debt definitions are used in the policy context in the OECD countries, reflecting differences in reporting standards and accounting systems of government debt. These differences can make fiscal assessment and international comparison difficult. They often result in different estimates of the size of government debt though usually showing similar trends (Section A1 in Annex). Each concept of debt conveys slightly different information and the availability of various statistics can be valuable. For instance, to assess debt refinancing needs it is better to refer to debt measured at face value (like in the Maastricht definition), while a current market valuation of debt, like in the

debt definition published by the OECD and based on the System of National Accounts, is more informative regarding the cost of buying back debt.

Debt levels are most frequently recorded for the general government sector, which comprises the central and sub-central governments as well as the social security system, with the central bank being outside the general government sector. However, to the extent that the different layers of government own enterprises or special purpose vehicles, debt in these units indirectly affects government balance sheets. Moreover, given the porosity between the general government sector and public enterprises, a comprehensive assessment of public sector fiscal positions should include such entities.

Several types of liabilities that can arise in the future are not usually contained in standard debt measures. They include:

- *Contractual pension obligations for civil servants*. They constitute an important contractual liability for several of the larger OECD countries, amounting to around 15-20% of GDP in Canada, the United Kingdom and the United States (Section A2 in Annex). Reporting of these liabilities varies among OECD countries, partly due to complexities of their estimations, limiting their international comparability. This situation should improve with the 2008 System of National Accounts which recommends the recording of liabilities of unfunded employer schemes on the core balance sheets (although some flexibility remains for government employer schemes that cannot be differentiated from general social security schemes). Reporting should include relevant information, such as the discount rate, whether future pension obligations are included, asset valuation methods, and the amount of risk inherent to the pension fund investments.

- *Liabilities related to future spending pressures due to population ageing and health care*. Under unchanged policies, the increase in public spending on health care, long-term care and pensions over the next 15 years for the larger OECD countries is estimated to total between 1 and 4% of GDP, primarily due to higher health and long-term care expenditures (Table 1). Uncertainty of these projections calls for providing sensitivity checks with regard to alternative assumptions in key population and economic variables and in benefit programmes' parameters or use stochastic simulations that can generate probability distributions of underlying variables and pension liabilities.

- *Other future contractual spending obligations such as those arising from Public-Private Partnerships (PPPs).* In response to an OECD questionnaire on infrastructure in 2008, only nine OECD countries stated that they reported the fiscal consequences of PPPs, although spending obligations arising from PPPs can be substantial (Sutherland *et al.*, 2011). Moreover, while PPPs can improve public sector finances for spending projects that allow an efficient risk transfer to the private sector, they are also prone to window dressing budgetary positions if they remain unaccounted for.

- *Other contingent liabilities*. Contingent liabilities result from an occurrence of an uncertain future event. In the wake of the recent financial crisis, they relate primarily to measures to support the banking sector. According to Eurostat, explicit contingent liabilities (excluding interventions by central banks) have declined, but in 2010 they still amounted to up to 5% of GDP in Germany, France and Sweden and about 25% of GDP in the United Kingdom (Section A3 in Annex). In addition, there are still risks that governments could be compelled to bail out financial institutions in the future. Estimates of such liabilities are difficult and highly uncertain. OECD best practice recommends disclosing the size and main classification of contingent liabilities (OECD, 2002). The larger OECD countries report some contingent liabilities (Section A3 in Annex). Reviewing the current reporting practices in line with evolving standards (IMF, 2011) would be beneficial. Also, past calls on the government should be published to facilitate *ex-post* analysis. If the probability of contingent liability can be reasonably estimated (*e.g.* based on option pricing), the expected loss for the government should be reported and, to the extent possible, adequate resources should be set aside.

On the asset side, reporting of non-financial assets in particular needs to be improved. This would help not only estimate the scope for asset sales but also comprehensively assess the efficiency of use. Relatively poor data coverage (Section A8 in Annex) frequently reflects the fact that many governments still do not have an appropriate inventory and the valuation of these assets at market prices, especially for non-marketable assets, is challenging. This partly relates to the diversified ownership of non-financial assets across layers of government and institutions, which does not provide proper incentives for revealing efficiency of their use.

Changes in ageing-related public spending for selected OECD countries

Change 2010-25, as percentage points of GDP

Change 2010-25, as percentage points of GDP

	Health care	Long-term care	Pensions	Total
Belgium	1.0	0.5	2.7	4.2
Canada	1.5	0.5	1.3	3.3
France	1.2	0.3	0.4	1.9
Germany	1.2	0.6	0.8	2.6
Italy	1.3	1.0	0.3	2.6
Japan	1.5	0.9	0.2	2.6
Netherlands	1.4	0.6	1.9	3.8
Sweden	1.1	0.2	-0.2	1.2
Switzerland	1.3	0.3	1.2	2.8
United Kingdom	1.1	0.5	0.5	2.1
United States[1]	2.0	..	0.9	2.9
Average	**1.3**	**0.5**	**0.9**	**2.7**

Note: OECD projections for increases in the costs of health and long-term care have been derived assuming unchanged policies and structural trends as of end 2009. The corresponding hypotheses are detailed in OECD (2006) under the heading "cost-pressure scenario". Projections of pension expenditures are taken from OECD (2011), which itself draws on European Commission Sustainability Report (2009) for EU country projections and various national sources for non-EU countries.

1. Based on CBO's 2011 Long-Term Budget Outlook, June 2011. Health care corresponds to Medicare, Medicaid, CHIP, and Exchange Subsidies; and Pensions to Social Security.

Sources: See note above and OECD calculations.

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1. The recently published Whole of Government Accounts for the United Kingdom provides a good example. It presents consolidated balance sheets for a broad public sector by augmenting the standard measure of net debt with non-financial assets, public service pension liabilities, financial sector interventions, Public Finance Initiative contracts and contingent liabilities (HM Treasury, 2011).

2. Managing debt cost and risks

5. Debt managers aim to secure non-interrupted funding at lowest medium-term costs subject to risks. They also aim at facilitating the central government's access to financial markets in the longer term and at supporting a well-functioning domestic financial market. The risk-cost profile of the debt stock is largely determined by its maturity distribution (with rollover risk declining and term premia usually rising with debt maturity) and the use of foreign currency denominated and indexed debt instruments. Strategic benchmarks, reflecting governments' risk tolerance and preferences on the trade-off between expected cost and risks, are important tools for portfolio control. Changing market conditions necessitates adjustments in debt portfolios, in particular debt duration, and sometimes also in strategic benchmarks. Such adjustments may be brought about by issuing new and different types of securities, exchanging securities, buying back securities or trading in derivatives. The last option facilitates a usually faster and cheaper changing of debt duration with less market disruptions than other options (Section A4 in Annex). In practice, debt portfolios and management vary among countries which partly reflect different risk preferences and partly country-specific characteristics, like the size and structure of the economy and financial markets, as well as investors' preferences.

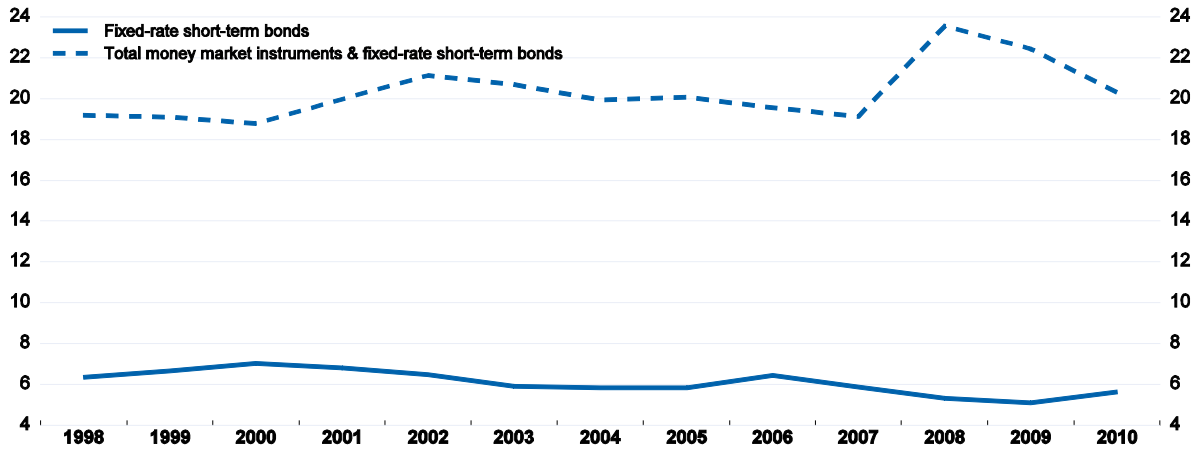
Term structure of debt

6. In many OECD countries the average maturity of marketable public sector debt declined during the financial crisis, reflecting attempts to quickly raise additional funds at the lowest borrowing cost, but has

been recovering since (Figures 1 and 2).[2] At the same time, debt levels and dynamics have deteriorated substantially in most OECD countries on account of rising deficits and cumulating debt servicing obligations. This might warrant revisiting the choice between costs and risks in benchmark portfolios.

Figure 1. Share of short-term debt

% of marketable central government debt



Note: The lines depict the simple average for Belgium, Canada, France, Germany, Italy, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. Short-term debt includes the debt instruments with a maturity up to one year.

Source: OECD, Central Government Debt database.

7. On the one hand, there is an incentive to exploit relatively low short-term interest rates by issuing short-term debt. On the other hand, heightened debt rollover risks associated with short-term financing could lead to sudden significant deteriorations in fiscal positions. This, in turn, would increase the risk of a backlash in economic growth.[3] Indeed, even the largest OECD economies have not been immune to sovereign debt concerns, with credit ratings downgraded for Japan and the United States in January and August 2011, increases in risk premia for sovereign debt in several euro area countries in the summer and autumn and warnings at various stages that the United Kingdom could lose its top rating. Moreover, the crisis has led governments into taking more risk on the asset side. On balance, this may imply attaching a larger weight to avoiding risk than prior to the crisis, suggesting to extend further maturities, possibly above pre-crisis levels.

8. Such a strategy might also lock in long-term interest rates that are still relatively low in most countries, with the notable exception of the increasing number of countries affected by the European debt crisis. In most countries, long-term rates are likely to rise over the medium term once economic upswing firms and monetary policies will move towards a neutral stance. Even if the yield curve reflects expectations about future rates, debt managers may be able to take advantage of differences in risk aversion, as it is also conceivable that risk aversion of financial investors will increase once yields move up. An illustrative example shows (Section A5 in Annex) that at present debt levels (100% of GDP on average) a one-percentage-point increase in interest rates across the yield curve could raise debt by up to

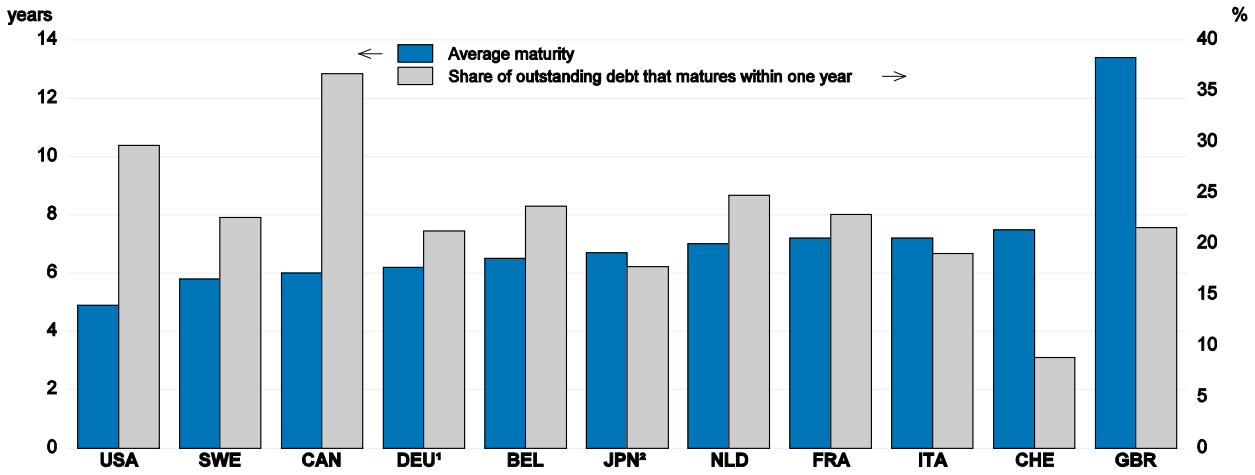
2. See Blommestein (2010). In countries with high market turbulence, the issuance of new debt was for some time confined to treasury bills.

3. Some models of debt dynamics suggest that at high debt levels a small increment in debt might suffice to push the economy on a contractionary output path (see *e.g.* Rankin and Roffia (2003)).

several percentage points of GDP within five years, with a bigger effect for shorter debt maturity. However, raising debt maturities could come into conflict with quantitative easing (QE) policies of monetary authorities (Section 6).

Figure 2. Debt structure

End-2010



Note: Countries are sorted according to average maturity.

1. Debt outstanding at 26 April 2011. The share of debt maturing within a year covers debt from 26 April 2011 through 25 April 2012.
2. Debt outstanding at end-March 2010 and the amount due during fiscal year 2010 (April 2010- March 2011).

Source: National authorities and OECD calculations.

Indexed debt instruments

9. Another policy issue is whether the composition of government debt (and assets) can help to hedge government revenue and spending against macroeconomic shocks. In particular, a hedge would be obtained if the government's debt servicing obligations were positively correlated with its tax receipts. Under this perspective, the optimal funding strategy depends on the type of shocks affecting the economy and the structure of the economy itself. For example, if an economy is prone to supply side shocks, with inflation and growth moving in opposite directions, issuance of nominal debt would be appropriate. However, assessing the types of shocks hitting the economy, and the sensitivity of the economy with respect to such shocks can be very difficult.[4] Alternatively, governments could obtain some protection of fiscal balances by issuing bonds that are indexed to certain economic indicators such as oil prices or GDP (OECD, 2010). In practice, issuance of indexed bonds of this type has so far been very limited, with GDP indexation having largely been confined to the context of debt restructuring of emerging markets.[5] Indeed, the fact that markets for indexed bonds are thin or even nonexistent reduces their attractiveness both for financial investors and for governments. Such markets are unlikely to emerge unless they were introduced on a significant scale by several countries at the same time. Also, lagged data releases and subsequent revisions are likely to hamper their use. The independence and reliability of the agency in charge of producing the relevant statistics would also be crucial for the success of such instruments.

4. For an example see Au-Yeung *et al.* (2006).

5. For example, some small countries such as Bulgaria, Costa Rica and Bosnia and Herzegovina issued bonds as part of their Brady restructurings that included clauses or warrants which increased their payments, if GDP reached a certain level (Griffith-Jones and Sharma, 2006).

Foreign currency debt

10. Foreign currency issuance increased somewhat across the OECD area during the financial crisis, reflecting attempts by debt managers to widen the circle of financial investors. However, the available information indicates that in almost all G10 countries securities issued in foreign currencies are either absent (Belgium, France, Switzerland and the United States) or account for only a small part, of less than 2%, of marketable government debt (Table 2), in contrast to the foreign currency exposure on the asset side (Section 5). Sweden is a noticeable exception with a foreign currency share of about 18% in 2010. However, effective foreign currency obligations are generally higher than apparent from the statistics due to foreign currency swaps, which are used either to hedge existing foreign currency obligations against exchange rate movements or to exploit interest rate differentials between different currencies.

Table 1. Structure of central government debt

Per cent of marketable debt, end-2010

per cent of marketable debt, end-2010

	Total money market instruments	Total bonds	Fixed-rate income instruments[1]			Index-linked bonds	Other bonds	Variable-rate notes	Debt held by non-residents	Debt in foreign currency
			Short-term bonds	Medium-term bonds	Long-term bonds					
Belgium	13.6	86.4	8.0	36.6	40.8	0.0	1.0	0.0	..	0.0
Canada	30.5	69.5	25.8	13.3	25.1	5.3	0.0	0.0	21.1	1.0
France	15.4	84.6	0.0	18.6	54.1	11.8	0.0	0.0	68.1	0.0
Germany	7.9	92.1	0.0	29.9	58.6	3.5	0.0	0.0	59.2 [2]	0.3
Italy	8.5	91.5	0.0	18.4	46.7	6.8	10.3	9.4	..	0.1
Japan[3]	18.8	81.2	9.2	34.0	32.2	0.7	5.1	0.0	..	0.0
Netherlands	19.1	80.9	9.4	33.8	37.8	0.0	0.0	0.0	..	1.8
Sweden	16.2	83.8	0.0	64.4	0.0	19.4	0.0	0.0	45.7	18.2
Switzerland	10.1	89.9	0.0	0.0	89.9	0.0	0.0	0.0	..	0.0
United Kingdom	4.7	95.3	4.0	21.5	47.8	22.0	0.0	0.0	26.1	..
United States	21.1	78.9	8.7	36.5	26.7	7.0	0.0	0.0	50.9	0.0

Note : 1. In general, the maturity of fixed-rate bonds is: up to 1 year for short-term, 1 to 5 years for medium-term, and above 5 years for long-term.

2. Securities of the federal government, states and municipalities combined.

3. End-2009 data.

Source: OECD, Central Government Debt database.

11. The share of domestic government debt held by non-residents is much larger though than the share of foreign-exchange-denominated issues, totalling for example around 70% in France and, outside the euro area, between 21% in Canada and 51% in the United States (Table 2). Thus, for the larger OECD countries, foreign currency issuance does not appear crucial for attracting non-resident financial investors, but exchange rate risk is a relevant factor in determining the demand for bonds, as indicated by the marked gap between non-resident holdings for countries within and outside the euro area.

12. Foreign investors might be more flexible than domestic investors in exiting bond markets, possibly due to legal requirements and less moral suasion by governments to hold domestic public sector debt. But, not all of them might be inclined to shift swiftly between alternative portfolios as this might entail massive financial losses or, in the case of sovereign investors, conflict with policy objectives such as exchange rate stabilisation. The difficulties China would encounter in diversifying its assets away from the US Treasury bonds stand as an example. Nevertheless, with debt levels having reached unprecedented levels, significant shares of bond holdings by non-residents reinforce the need to establish credible medium-term consolidation programmes so as to reduce the risk that unsustainable fiscal positions trigger abrupt reductions in foreign demand for domestic government bonds.

3. Committing to price stability

13. With mushrooming debt, there is a temptation to reduce debt through inflation. At a gross debt level of 100% of GDP and under stylised assumptions about growth and interest rates that correspond to projected characteristics of many OECD countries, a permanent inflation increase of 1 percentage point which is immediately and fully translated into nominal interest rates would lower the debt ratio after ten years by between 5 and 9 percentage points, depending on whether debt turnover is high or low (Section A6 in Annex). At medium turnover rates, annual inflation of around 6% would be required over a 10-year period to erode the average crisis-induced increase in the debt ratio in the OECD area. In an environment of financial repression, higher inflation would have stronger effects on the real value of public debt.

14. The costs of high inflation would likely outweigh the potential fiscal benefits and conflict with policies that aim at improving market confidence. High and persistent inflation might negatively affect macroeconomic stability and damp real growth via rising (relative) price and exchange rate volatility and negative wealth effects. There is also large uncertainty regarding the authorities' capability to generate higher, but still stable, inflation without de-anchoring inflation expectations. With de-anchored inflation expectations, interest rates paid on debt would likely increase more than inflation. Moreover, debt roll-over risks would increase as financial investors would demand shorter maturities of newly issued debt. In any case, the costs of disinflation at a later stage would need to be added to the costs of inflationary policies.

15. In a time of high indebtedness, governments might signal commitment to low inflation by issuing securities of short maturity or indexed to inflation as this makes eroding debt with inflation less effective. Well-anchored inflation expectations, beyond their impact on investment and growth, lower *ceteris paribus* overall debt servicing costs. However, such actions may not be efficient nor needed, given independent central banks' mandate to keep price stability.

4. Keeping government bond markets liquid

16. The supply of government bonds to the capital market is important in several respects. First, liquid markets for government securities are needed to contain or reduce liquidity premia demanded by financial investors and thus debt servicing costs. Second, government securities act as "risk-free" benchmarks for the pricing of private sector credit and derivatives. Third, they act as regulatory liquidity buffers for banks, the more so in the light of new regulatory initiatives of Basel III. Fourth, government securities act as regulatory capital for banks and pension funds. Fifth, over and above their regulatory function, they are attractive investment instruments for financial institutions, notably pension funds, with long-term contractual obligations *vis-à-vis* their clients. Managing the supply of benchmark instruments, taking into consideration market developments and new regulatory initiatives, may thus be part of the government debt managers' objectives, possibly in co-ordination with central banks (Section 6).

17. Required liquidity reserves by banks are likely to increase substantially in the near future on account of forthcoming Basel III regulation. Research indicates that banks' liquid assets fall short substantially relative to the new standard (Basel Committee on Banking Supervision, 2010). According to estimates by the Basel Committee, as of end 2009 additional liquid assets needed to meet the new mandatory requirement amounted to 1 trillion euro in the euro area alone (or about 11% of euro area GDP). Effective additional demand would likely be higher, given that banks tend to hold precautionary reserves above mandatory levels. While sizeable, banks' additional demand should be met by the increase in bond issuances resulting from higher public debt (assuming high quality of debt).

18. The demand for funded private sector pensions as a supplement to social security pensions has increased. This is triggered to a considerable degree by stress on pay-as-you-go systems in ageing societies

and associated pension reforms. In addition to demographic risks, pension funds face interest rate, inflation and real income risks, with the latter two being more relevant for defined benefit than defined contribution schemes. The requirements of pension funds to efficiently hedge their obligations are unlikely to be met by the supply of high-rated private sector bonds alone, such as highly collateralised mortgage-based securities in Germany (*Pfandbriefe*) and some Nordic countries (Schich, 2008). More generally, while long-term risks can be hedged to some extent within the private sector, the supply of long-term government bonds influences the ability of the private sector overall to hedge such risks.

19. In almost all OECD countries, with the notable exception of the United Kingdom, markets for government securities with maturities of more than ten years are relatively thin.[6] Thus, the perspective of supplying the market with instruments that are suitable to hedge long-term obligation provides an additional argument in favour of issuing bonds with long durations (10, 20, 30 years or even longer) (Blommestein and Wehinger, 2007). It might also be worth considering to extend the supply of inflation-indexed bonds and to issue securities that are indexed to GDP (Section 2) which could be utilised by pension funds to hedge pension obligations under defined benefit schemes. This could have the additional benefit that capital markets would be better able to discount the economic impact of government reform measures with long-term implications.

5. Managing public sector assets

20. Financial and non-financial assets impact, together with liabilities, on the costs, yields and risks of the public sector balance sheet. While debt management offices are not concerned with the management of government assets, aspects of portfolio management are relevant on the asset side as well. For example, asset yields might be correlated with the business cycle and fall pro-cyclically along with tax receipts, and asset prices might fall in the presence of adverse economic shocks. However, there are important other motives for governments holding assets, stretching beyond those of standard portfolio management to include, in particular, issues of political economy.

21. For the G10 countries, financial assets in the government sector total 42% of GDP on average, ranging between 20% in Belgium and 83% in Japan (Section A7 in Annex). In several countries, financial assets rose in response to the financial crisis on account of equity participations or loans to the financial sector. Securities are the largest category for most OECD countries, accounting on average for nearly half of total financial assets (Section A7 in Annex). They include mainly shares and other equity (about 40% of total assets on average). By function, the largest single asset-holding entities are social security funds, which account for more than 30% of general government financial assets in France, Japan and Sweden.

22. Available information suggests that the value of public sector non-financial assets, such as buildings and infrastructure, exceeds the value of financial assets. However, in most countries, comprehensive and detailed information on non-financial assets is lacking. Among the G10 countries, France is the only country which reports all non-financial asset categories (Section A8 in Annex).

Building reserves

23. Prefunding of future liabilities can be efficient for the purpose of tax smoothing, if future spending hikes are temporary and would otherwise need to be financed by temporary tax increases causing dead-weight losses. This might be the case to a limited extent for ageing-related outlays, such as for example the additional spending associated with particularly large cohorts in retirement. Moreover, building reserves can contribute to making the fiscal implications of future spending visible in current fiscal positions, in

6. The share of bonds with original maturity of 20 years or longer in total central government debt is about 7½ per cent on average for the G10 countries that report such data.

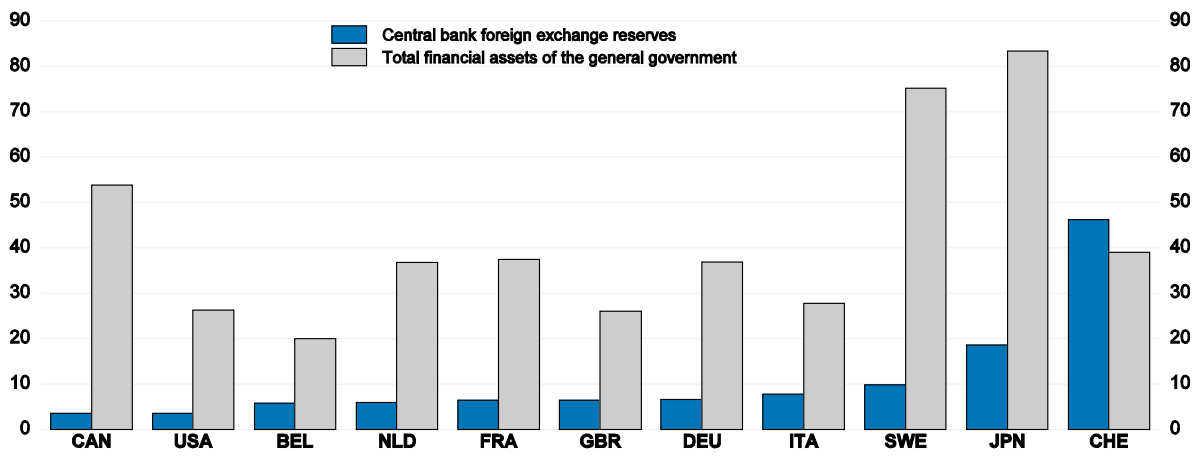
particular for social security benefits. However, there is a risk that under political pressure the funds will be used for current spending or tax reductions or for investment in government programmes that yields below-market returns. Indeed, in the past civil-service pension funds in some countries have been used to finance government spending projects in areas like housing and welfare-related infrastructure (OECD, 2005).

24. Keeping contingency reserves might be effective in rapidly providing the financial means necessary to cushion adverse unforeseen events. In particular, in response to the financial crisis it has been suggested to install reserve funds to help fund financial aid for potential future financial crisis resolution.[7] Liquidating accumulated financial assets during a crisis could negatively affect certain segments of the capital market (which would not be relevant, however, if assets can be used directly for recapitalisation). In spite of various trade-offs, not least related to moral hazard, there is probably a case for some pre-funding of potential recapitalisation needs. Liquid assets may also help insure against short-term dysfunction in government funding markets and thus have an option value.

25. Foreign exchange reserves held by central banks constitute a special case of contingency funds. In general, such reserves are kept to ensure the proper functioning of markets and financial stability as they can facilitate meeting obligations stemming from foreign currency denominated government debt or current account deficit in case of a prolonged loss of access to foreign credit. Countries with managed exchange rate regimes also accumulate the reserves due to exchange rate interventions. Among G7 countries, China and a few smaller countries, at the end of 2010 foreign exchange reserves were high in China (around 50% of GDP), Switzerland (46% of GDP) and Japan (19% of GDP), reflecting mainly exchange rate interventions, while in remaining countries they averaged at around 6% of GDP and were relatively small compared with total financial assets (Figure 3). Foreign exchange reserves are usually

Figure 3. Central bank foreign exchange reserves and total financial assets of the general government

2010, % of GDP



Note: Countries are sorted according to foreign exchange reserves.

Source: IMF, IFS database; and OECD Economic Outlook 89 database.

managed by central banks and this may complicate the coordination of balance sheet management between the general government and the central bank (Section 6).[8] Moreover, a build-up in foreign currency

7. For example, Sweden and Germany have installed funds to aid future crisis resolution if needed. Proposals along these lines have been made by European Commission and the IMF. See also Schich and Kim (2010).

8. According to the national accounts conventions (though not always in national financial accounts), the central bank is outside the general government sector (Box 1 and Section A1 in Annex). However, given its functions,

denominated assets involves international spillovers by affecting exchange rates as well as prices of debt instrument in other countries.

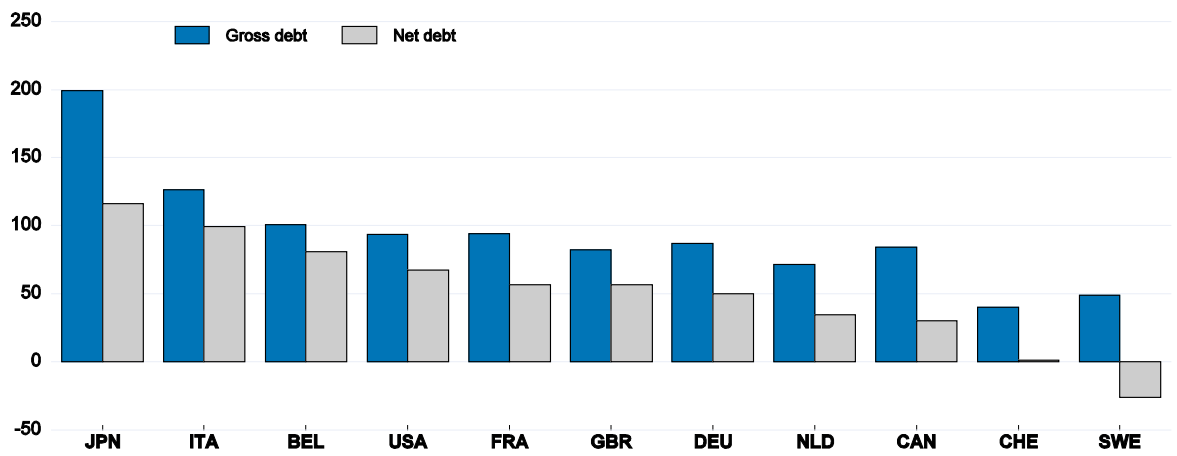
26. Some governments in countries that are producers of non-renewable raw materials have established funds to save revenues from the sale of commodities. Raw materials constitute non-financial wealth, which upon their extraction are transformed into financial wealth. As they are depletable resources there is a strong rationale to save part of the temporary revenues that are associated with extraction for the purpose of transmitting wealth to future generations. Moreover, since a substantial part of public sector revenues in commodity-producing countries might be sensitive to terms-of-trade changes (and given that efficient hedging over longer periods of such risks in capital markets has its limits) such funds can help buffer fluctuations in revenues. This allows smoothing taxes, reducing the deadweight costs associated with changes in tax rates. On the other hand, depending on the level of gross debt, using surpluses to reduce debt might be preferable.

Reducing gross debt via asset sales

If assets are held together with debt, they are effectively debt financed. For all G10 countries, gross debt exceeds financial assets by a significant margin (by 116% of GDP in Japan), with the notable exception of Sweden where the opposite is the case (Figure 4). Since the sale of assets also eliminates income earned on them, the net budgetary effect depends on relative yields. Precise information on asset yields is hard to obtain from aggregate statistics (Section A7 in Annex). To some extent it might be possible to use assets so as to hedge risks on the liability side of the government balance sheet or budgetary

Figure 4. Gross and net debt

2010, % of GDP



Note: Countries are sorted according to net debt. 2010 is an estimate for Japan and Switzerland.

Source: OECD Economic Outlook 89 database.

spending or revenue risks more generally. It is not clear though that a combination of debt and debt-financed financial assets would allow for more efficient management of yields and risks of the government's balance sheet than holding no assets at correspondingly reduced gross debt. To the extent that government bond yields are influenced by gross rather than net debt, holding liabilities and financial assets simultaneously could be a

and interactions with balance sheets of the central government, it might be appropriate to include it in a wider public sector.

costly strategy, in particular as budgetary risks increase with the degree of leverage. However, as highlighted above, there are a number of policy objectives that suggest holding assets in the public sector even in the presence of liabilities. In any case, managing government balance sheets becomes more involved in the presence of significant financial assets, calling for coordination between debt and asset management.

29. Privatisation of government assets not only reduces gross debt but may also boost economic growth provided that certain conditions are met.[9] In particular, privatisation should be accompanied by appropriate regulatory provisions addressing market failures that may exist in areas operated by public firms. In this regard, sales justified merely by revenue needs that leave necessary regulatory changes unaddressed should be avoided.

30. Portfolio risks are also relevant. In particular, stakes in banks increase the exposure of government balance sheets to macro-economic shocks. Bank profits are pro-cyclical, putting an additional burden on general government finances at times when tax bases shrink and unemployment-related outlays rise. This holds the more so as cyclical downswings might originate in or be amplified by the financial sector. This suggests unwinding equity participations in banks once macroeconomic conditions permit. In many countries gross debt levels could be reduced substantially by unwinding equity participations and loans that were accumulated in response to the financial crisis. If, as an illustration, assets were reduced to pre-crisis levels, government debt-to-GDP ratios would drop by up to 13-14% in the Netherlands and Germany, although there would be no effect in Japan, France and Switzerland (Section A9 in Annex).

31. Beyond unwinding equity participations in banks, the scope for sales of financial assets may be limited in practice and likely to be insufficient to return debt ratios to pre-crisis levels (Section A9 in Annex). Depending on the macroeconomic situation, the private sector may not be in a position to absorb large privatisations (including the sale of real estate) without significant discounts. And in countries with as yet weakly developed financial markets, such as China, privatisation would raise a number of additional challenges. Moreover, with extensive privatisations having already taken place, successful sales of public companies may be increasingly difficult to realise. Politically, liquidating assets might also be difficult, not least because subnational governments and social security funds are major owners, the former owning more than half of general government financial assets in Canada, Germany and the United States (Table 3). All of these aspects suggest that privatisation programmes should be based on cost-benefit analysis and not be driven solely by debt-reduction objectives. This applies to non-financial assets as well.

Table 2. Sub-sectoral structure of general government assets

Per cent of total assets, 2009

	Belgium	Canada	France	Germany	Italy	Japan	Netherlands	Sweden	Switzerland[1]	United Kingdom	United States
General government	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Central government	64.9	26.1	58.2	35.6	69.1	46.8	67.5	49.6	43.8	69.8	35.1
State government	11.4	50.5	..	31.0	..	..	..	..	39.4	..	64.9
Local government	8.1	7.4	9.5	22.3	12.6	14.2	24.1	16.2	3.0	30.2	..
Social security funds	15.6	16.0	32.3	11.0	18.3	39.0	8.4	34.2	13.9	..	..

Note: 1. 2008 data.

Source: OECD, System of National Accounts database.

6. Monetary policy interactions

32. Monetary, fiscal and debt management policies interact with each other in various ways, affecting government finances, real activity and inflation. Central bank operations affect general government

9. Public sector firms might distort relative prices and competition and there is empirical evidence that divested firms often became more efficient and profitable and increased investment spending (Megginson and Netter, 2001). Moreover, to the extent privatisation involves cuts in employment, it is often associated with efficiency improvements that support the reallocation of resources in the economy.

finances, in part because some share of the central bank profits accrue to the government. In an extreme case, it is conceivable that central bank losses might require capital injections by the government. The central banks' counterparty risk associated with reserve and repurchase operations are normally low as only high-quality securities are accepted as collateral. However, under liquidity-support measures for banks in response to the financial crisis the criteria for admissible collateral were relaxed (allowing for example for swaps of private assets against government bonds). While liquidity-enhancing measures proved to be a major policy tool in coping with the crisis, they came at the expense of risks accumulating on central banks' balance sheets and thus, indirectly, on the general government balance sheet.

33. Quantitative easing (QE) policies, conducted in the first place by the US Federal Reserve and the Bank of England, further increase the risks for government finances. By purchasing private sector and government securities, QE aims at stimulating private sector activity via lowering credit cost, generating positive wealth effects and raising the returns on investment. Purchases of government bonds (or agency bonds in the United States), which accounted for the largest part of total QE, mainly focussed on maturities of several years so as to provide relatively close substitutes to longer-term private sector credit, notably mortgages in the housing market, and raise the likelihood of bidding up the price of private sector assets as well. Asset purchases effectively shift risky financial assets from the private sector onto the balance sheet of the central bank or a special QE fund in exchange for risk-free central bank reserves. In some cases, the takeover of potential losses by the government has been explicitly agreed between the government and the central bank.

34. Debt management might also affect the effectiveness of monetary policy. Debt portfolio or liquidity management may suggest a duration profile of government debt that differs from the one that would be desirable from the perspective of maximising the impact of QE policies on private sector activity. In a similar vein, unconventional monetary policies that drive down longer-term yields increase the fiscal incentives to extend debt maturities but this might counteract the purpose of monetary policy. The flip side is that unconventional monetary policy can negatively affect government funding costs.

35. While internalising interdependencies between monetary policy and government balance sheet management would go against the mutual independence of the institutions involved, a better knowledge of each other's reaction function may prevent inefficient outcomes. In the same vein, integrating central banks into a more comprehensive accounting framework for the balance sheet of the wider public sector might be worth considering.

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ANNEX

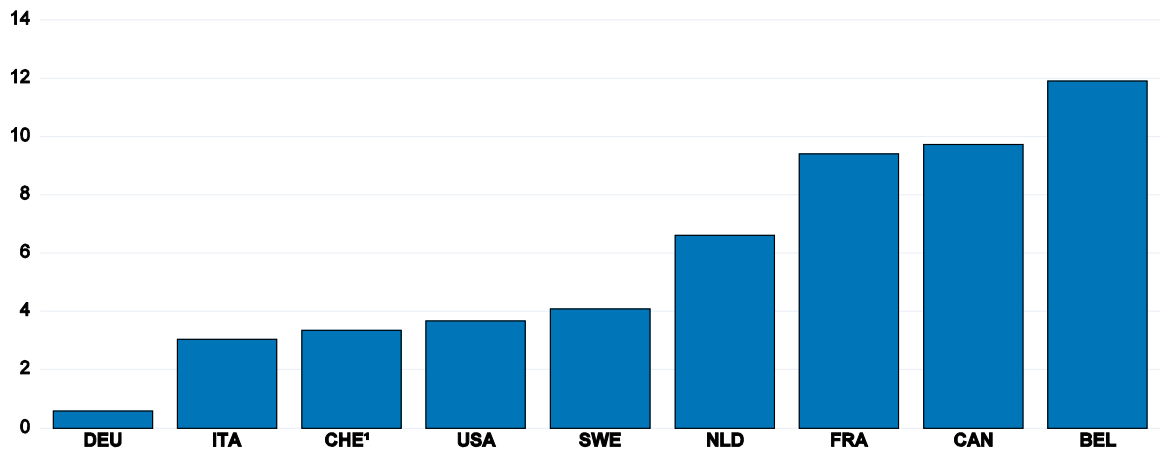
A1. Debt concepts

1. Several conventional debt definitions are used in the policy context in the OECD countries, reflecting differences in reporting standards and accounting systems of government debt. This can make fiscal assessment and international comparison difficult. Existing accounting standards leave some room for judgment on how to account government liabilities that may lead to underreporting of debt. Incentives for governments to use such leeway to present more flattering fiscal accounts are especially strong when limits set by fiscal rules are binding (Koen and van den Noord, 2005).

2. The OECD in its standard fiscal assessment utilises gross debt as defined by the System of National Accounts 1993 (SNA93) for the general government sector on a consolidated basis.[10] SNA93 measures fiscal flows on an accrual basis for a given reporting period and debt does not include contingent liabilities. Consolidation eliminates transactions which occur between two units of the general government sector, comprising central, state and local governments, and social security funds. Thus, consolidated debt shows how much of government's debt has been absorbed by the private domestic sector and the rest of the world. Consolidation does not affect net debt in contrast to gross debt. Among the G10 countries for which comparable data exist, non-consolidated debt is higher than consolidated by around 10% of GDP in Belgium, Canada and France (Figure A1). Consolidated measures may therefore underestimate total refinancing needs. Despite common accounting standards, the international comparability of the SNA93 gross financial liabilities is limited due to different definitions or treatment of certain components.

Figure A1. Differences between non-consolidated and consolidated general government debt

2009, % of GDP



Note: Debt held within the general government sector.

1. 2008 data.

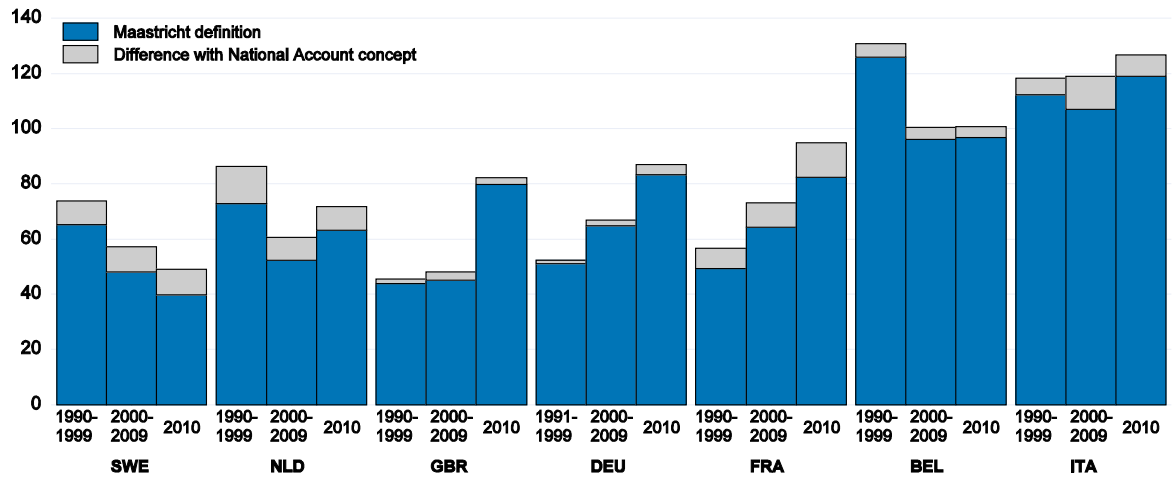
Source: OECD, System of National Accounts database; and OECD Economic Outlook 89 database.

10. The SNA93 is a set of internationally agreed concepts, definitions, classifications and rules for national accounting. For EU countries, government debt data are based on the European System of Integrated Economic Accounts (ESA95), which is the legally binding accounting standard in the EU. ESA95 is derived from SNA93 and thus is consistent with SNA93 definitions and classifications rules of the general government sector.

3. In the European Union (EU), fiscal policy assessments are based on the Maastricht definition of debt which is required by the Treaty in the context of evaluating the Excessive Deficit Procedure and Maastricht fiscal criteria. For the G10 EU countries, the Maastricht debt ratios have been generally below the SNA93 measures, with the gaps varying over time, but have followed similar trends (Figure A2). The gaps are large (above 6 percentage points) in France, Italy, the Netherlands and Sweden, while they are small in Belgium, Germany and the United Kingdom.

Figure A2. General government gross debt: SNA vs Maastricht definition

% of GDP



Note: The first two bars for each country depict averages for the years indicated underneath. Countries are sorted according to the SNA93 debt level in 2010.

Source: OECD Economic Outlook 89 database.

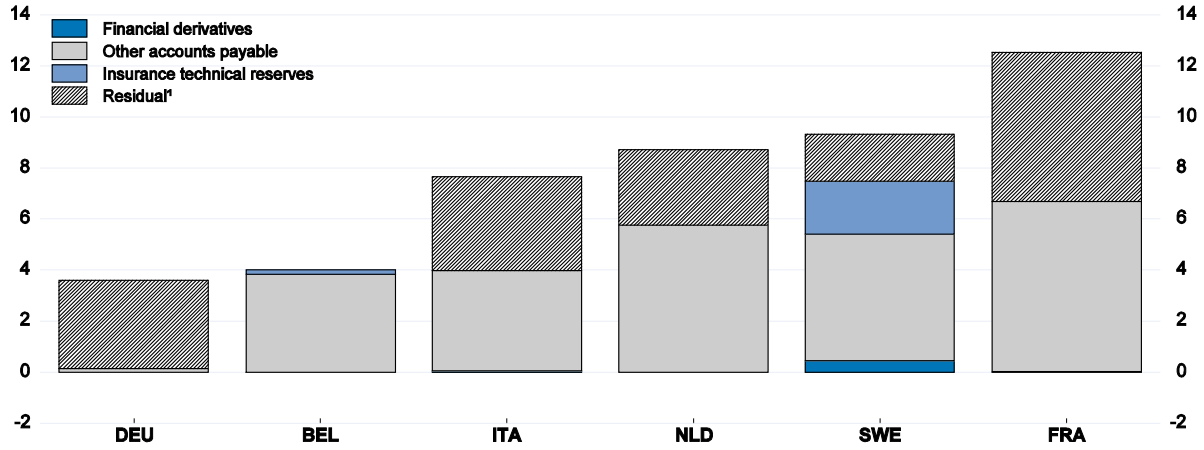
4. There are two main differences between the SNA93 and Maastricht definitions of debt. The first concerns the valuation methodology. The Maastricht definition evaluates debt at face value, which is equivalent to the amount that the government has to pay back to creditors at maturity. In contrast, the SNA93 employs market values.[11] Maastricht debt is thus a better measure for assessing government refinancing needs, but the SNA93 captures more adequately the cost of buying back debt. For non-tradable debt instruments market valuation is not available, requiring imputation of prices by some alternative methods. Also market valuation might be problematic for tradable instruments when markets are volatile or/and illiquid. Consequently, the SNA93 measure can be more volatile than the Maastricht one. Indeed, over the past two decades the standard deviation of changes in annual SNA93 debt ratios was greater than for the Maastricht data. The second difference is that Maastricht gross debt does not include liabilities related to other accounts payable (comprising trade credits and advances), financial derivatives, and

11. For the United States, Flow of Funds estimates of gross debt are used, which value debt at face value.

insurance technical reserves. Identifying exact contributions of the two factors to differences in debt level between SNA93 and Maastricht definition is not straightforward. The exclusion of debt items seems to explain most of the gap in Belgium and Sweden, but almost none in Germany (Figure A3).

Figure A3. Differences between Maastricht and SNA93 debt ratios

2010, % of GDP



1. Residual is the difference between the overall gap and the sum of three debt items excluded from the Maastricht debt definition. It may include valuation effects and statistical discrepancies.

Source: Eurostat.

5. In some OECD countries domestic debt definitions, that differ both from SNA93 and Maastricht concepts, are used in addition in the policy context. For instance, in the United States economic discussions primarily focus on federal debt held by the public. It includes debt held by the Federal Reserve System, but excludes debt held by other parts of the federal government, such as the Social Security trust fund. In the fiscal year 2010, federal debt held by the public totalled 62% of GDP, which was significantly lower than the general government consolidated debt measured by the OECD of 91% of GDP. In the United Kingdom, the main debt indicator used domestically is Public Sector Net Debt (PSND), which is a part of the government fiscal policy framework. PSND is defined as financial liabilities, measured in nominal values, issued by the public sector less its liquid financial assets, where the public sector includes public corporations and the Bank of England (Hobbs, 2011). At the end of 2010, PSND stood at 149% of GDP, which was significantly above the general government consolidated debt measured by the OECD of 56% of GDP. This high level of PSND is largely explained by financial interventions since 2007, their exclusion lowers debt to 59.2% of GDP.[12]

A2. Contractual liabilities for civil servants

6. Pension obligations for public sector employees constitute an important contractual liability for several OECD governments. Civil servants commonly enjoy special pension arrangement. The exact nature of these schemes differs across the OECD and across various layers of government or states. Civil

12. The "PSND ex" excludes measures that are judged to be temporary, like public sector banks balance sheets (the government intends to sell them), Special Liquidity Scheme and Asset Purchase Facility, while includes permanent ones related to equity and capital injections in banks. The PSND by construction biases upwards net debt in the respect that it includes all liabilities of public sector banks, but excludes their illiquid assets like mortgages and corporate bonds (Hobbs, 2011).

servants pension benefits are effectively fully guaranteed to be paid. In particular in the United States, many pension benefits are guaranteed by law, legal precedent or the state constitution. In the past they were paid in full despite financial problems of local authorities. Consequently, public pension benefits in the United States are regarded as "riskless obligation" with a probability of default close to that of the US Treasury bonds (Biggs, 2010).

7. Reporting civil servants pension liabilities is challenging as it requires estimating the net present value of schemes.[13] The choice of appropriate discount rate is crucial in this respect. According to finance theory, it should reflect the certainty of pension liabilities and should not be equated with the projected rate of return on assets that does not take into account risks, as is sometimes assumed by actuaries (Biggs, 2010). The latter approach underestimates the present value of future liabilities and creates perverse incentives to invest in risky assets which promise higher – not risk adjusted – yields. As pension liabilities are virtually guaranteed (see above) they should be discounted with a risk-free interest rate which is usually lower than the projected rate of return. Moreover, expected rates of return should be adjusted for risks. In practice, this can have serious implications for the market valuation of pension liabilities. For instance, in the United States estimates of market valuation, based on a risk-free interest rate and accounting for risk-adjusted returns, point to six times larger liabilities ($3 trillion, 20% of GDP) than liabilities reported by the pension funds themselves based on the projected average rate of asset return of 8% and not taking into account risks (Biggs, 2010). Similarly, in the United Kingdom, using the index-linked gilts rate instead of the corporate AA bond rate increases the estimated present value of pension liabilities in 2010 from £993 billion to £1 176 billion, *i.e.* 20% of GDP (Hobbs, 2011). Another complication relates to the choice between accounting only for past service, *i.e.* accumulated benefit obligations to date, and accounting for past and projected future benefit obligations of current employees.[14] The latter method requires assumptions about future wage increases and the length of service and generally renders higher obligations. Finally, for funded schemes the present value of pension liabilities is sensitive to the valuation of assets held in the scheme. Actuarial and accounting rules for pension plans allow for smoothing of asset values by applying average market prices over a certain period instead of using most recent market valuations. Consequently, market price volatility is not immediately reflected in asset values.

8. The reporting of unfunded public sector pension liabilities varies across the OECD countries. From the perspective of national accounts future liabilities are not accounted in debt, although this will change in the 2008 SNA with respect to unfunded employer schemes.[15] Nonetheless, from the economic perspective they should be reported, especially as the size of these liabilities can be substantial. Indeed, most of the OECD countries do not report them as debt, but some countries release official estimates of the present value of future liabilities. In contrast, Canada includes officially estimated unfunded pension liabilities in its national debt measure, which amounted to 14.6% of GDP in 2010.[16]

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13 . Present value is calculated by discounting future liabilities as a function of the time distance from the present to the moment of liability payment and a discount interest rate. The further in time the liability and the higher the discount rate, the lower the net present value of future liabilities.

14 . An even more extreme case would be to account for pension obligations of future employees.

15. The 2008 SNA recommends the inclusion of all unfunded employer pension schemes in debt measures (except those schemes that are difficult to distinguish in practice from social security schemes). So far, Australia is the only OECD country to have moved to the 2008 SNA.

16. Australia and New Zealand follow the same practice. Unfunded pension liabilities are estimated at 21.5% of GDP in 2009 for Australia and 4.5% of GDP in 2008 for New Zealand. These liabilities are subtracted from the debt measure used in the *OECD Economic Outlook* database to make them more comparable across countries (see *Economic Outlook Methods and Sources*).

9. More systematic and internationally comparable standards of reporting future civil servants pension liabilities would be desirable. In this respect, it is welcome that all EU countries will be obliged to report estimates of pension liabilities as of 2014 (ECB, 2009). Due to complexities of their estimations, international comparison of such statistics may be limited and thus their reporting should include relevant information such as the discount rate, whether future pension obligations are included, asset valuation method, and the amount of risk inherent to the pension fund investments. Given inherent considerable uncertainty, they could be presented as ranges or probabilities that collected assets will be enough to meet pension obligations.

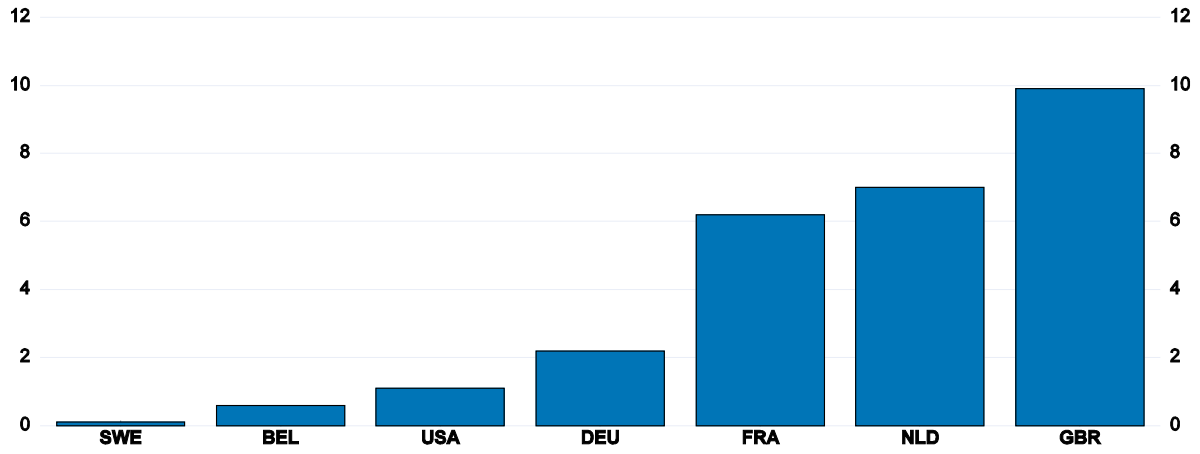
A3. Contingent liabilities

10. Contingent liabilities relate to liabilities that only materialise if (and when) an uncertain future event occurs. They are explicit when a specific contract stipulates conditions triggering government payment (for instance in the case of loan guarantee) or implicit when payments are at the discretion of the government and when there are high opportunity costs of not intervening (*e.g.* when bailing out financial institutions). Contingent liabilities are difficult to estimate (see below) and are often excluded from conventional debt measures. They should nonetheless be monitored, even if imperfectly, as they may have serious implications for fiscal sustainability.

11. In the wake of the recent financial crisis, many OECD governments have implemented measures to support the banking sector that imply contingent liabilities. Among these measures are government guarantees of banks' bond issues. Although the take-up was lower than initially committed by governments,[17] these guarantees added up to a sizeable share of GDP for some countries (Figure A4).

Figure A4. Government guarantees for bank bonds

2009, % of GDP



Source: Levy and Schich (2010), "The Design of Government Guarantees for Bank Bonds: Lessons from the Recent Financial Crisis", *OECD Financial Market Trends*, No. 98, Vol. 2010/1.

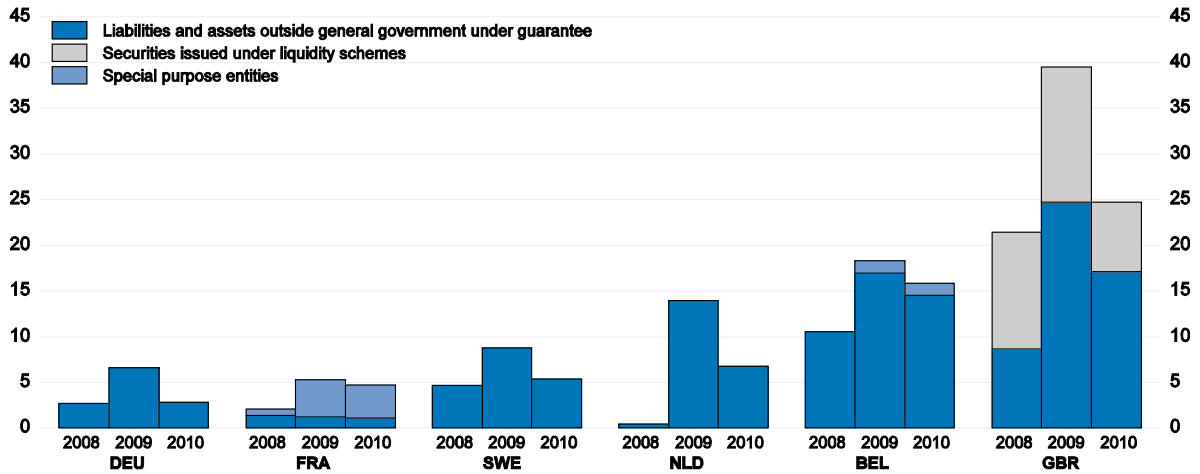
17. This partially reflected high price. In the European Union the price was linked to banks' credit risk as measured by CDS spreads (ECB, 2010).

Among the G10 countries, all government-guaranteed bonds have already matured in Belgium and are to mature before the end of 2011 in the United Kingdom and the United States, while in remaining countries in 2014 at the latest (Levy and Schich, 2010). Contingent liabilities have increased also due to bank asset support measures. They generally involved either measures that removed bad assets from the balance sheets of banks to a separate institution ("bad bank") or asset insurance schemes or a combination of the two. According to ECB (2010), these were relatively low in the euro area and the United States (around 1% and 3% of GDP) and very high in the United Kingdom (close to 14% of GDP).[18]

12. According to Eurostat data, in 2010 the total amount of contingent liabilities related to governments' help to financial institutions (excluding interventions by central banks) in the EU countries in the G10 was sizable in Belgium (16% of GDP) and the United Kingdom (25% of GDP), but limited in France, Germany, the Netherlands and Sweden (below 7% of GDP) (Figure A5). For most countries, the estimated contingent liabilities in 2010 were below their peaks in 2009 as some of the guarantee schemes had expired. Up to end-2010 there were no calls on guarantees. The fees associated with the guarantees have had a negligible impact on budget balances, improving it by a few decimals of a percentage point of GDP.

Figure A5. Contingent liabilities

2008-10, % of GDP



Source: Eurostat.

13. Apart from the above explicit contingent liabilities, some risk remain that governments could be compelled to bail out financial institutions going forward. Estimates of such liabilities are, however, difficult and are subject to high uncertainty. For instance, Standards & Poor's simply calculates them by multiplying estimates on the potential proportion of credit to the private sector and non-financial public enterprises that could become problematic during a recession[19] by the ratio of domestic credit to GDP. Based on 2010 data, this approach suggests that implied contingent liabilities in the G10 countries could

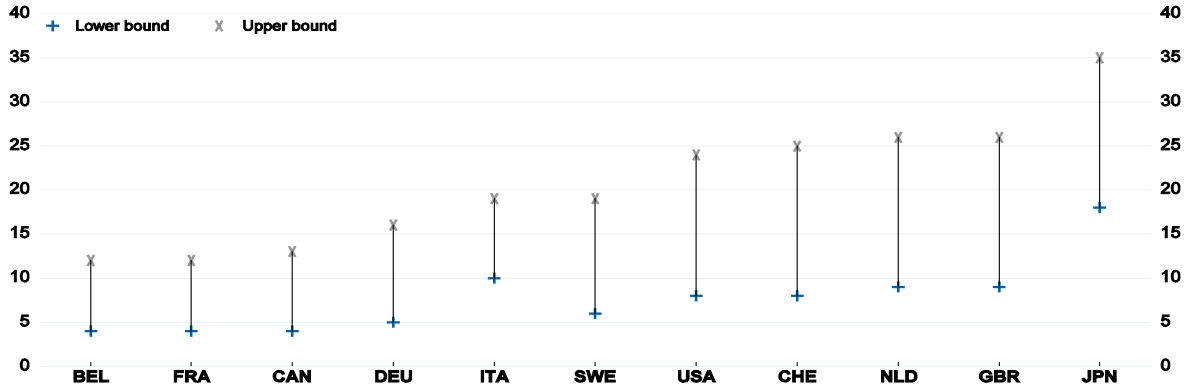
18. For the United Kingdom, the ECB estimate is lower than the final amount of assets placed by the Royal Bank of Scotland (RBS) under the Asset Protection Scheme (£282 billion; 20% of GDP), but it is in line with the implied loss for the Treasury. Under the final agreement, RBS bears the first £60 billion of losses and the Treasury meets 90% of any subsequent losses. Thus, in the extreme case that all insured assets are lost, the cost for Treasury will be £200 billion (around 14% of GDP). The Lloyds Banking Group, intending initially to insure £260 billion of assets, ultimately did not participate in the scheme.

19. Estimated at 5-15% for Belgium, France, Germany, the Netherlands, Switzerland, the United Kingdom and the United States; and at 10-20% for Italy and Japan (Standard & Poor's, 2010).

range from around 5-10% of GDP in Belgium to around 20-35% of GDP in Japan (Figure A6). In case of banks' failure, especially a systemic one, public support could also be needed to bolster deposit insurance schemes, thresholds of which were increased during the crisis (Schich and Kim, 2011).[20]

Figure A6. S&P's estimated contingent liabilities related to the banking sector

Lower and upper-bound estimates in 2010, % of GDP



Source: Standard & Poor's (2010), Ratings Direct. S&P's Banking Industry Country Risk Assessments: Global Annual Roundup, 7 August 2007, updated on 8 November 2010.

14. Assessing risks for fiscal sustainability stemming from contingent liabilities requires disclosing information on their total amount as well as on their main classification in line with the OECD best practices for budget transparency (OECD, 2002). Standards for measuring contingent liabilities are still evolving due to their complexities (IMF, 2011), and thus they may not be comparable across countries. Also, past calls on the government should be published to facilitate *ex post* analysis. Around ⅔ of the G10 countries already provide information on selected contingent liabilities in budget documentation as memorandum items (OECD, 2007; Table A1). They relate mostly to loan guarantees. If the probability of

Table A1. Reporting contingent liabilities in selected OECD countries

	Type of contingent liabilities							Contingent liabilities noted in the budget documentation
	Not defined	Loan guarantees	Law suits pending	Public Private Partnerships, Private Financial Initiatives	Environmental degradation	Other guarantees	Other	
Belgium	x							
Canada		x	x		x		x	x
France		x	x				x	x
Germany		x		x				x
Italy	x	x			x			
Japan	x							
Netherlands		x				x		x
Sweden	x							x
Switzerland		x			x		x	
United Kingdom		x				x		x
United States							x	x
OECD frequency	24.2%	60.6%	15.2%	18.2%	12.1%	21.2%	18.2%	66.7%

Source : 2007 OECD survey of budget practices and procedures in OECD countries.

20. In the EU prior to the crisis the legislation required a minimum level of insurance of €20 000. This level was raised to €50 000 in October 2008 and then permanently fixed at €100 000 as of 2011. In some countries blanket guarantees for all retail deposits were issued (*e.g.* Germany and Ireland). In the United States, deposit insurance has been increased to $250 000 from $100 000.

contingent liability can be reasonably estimated (*e.g.* based on option pricing), the expected loss for the government should be reported and, to the extent possible, adequate resources should be set aside. In particular, the International Public Sector Accounting Standards (IPSAS) recommends that if the probability of contingent payments is more than 50% and the payments can be reliably estimated, the government is required to recognise the corresponding expense and an increase in its liabilities. Moreover, it is also desirable to set fees on explicit guarantees that reflect the expected net present value of the guarantees' lifetime costs.

A4. Portfolio management with derivatives

15. In most OECD countries, public debt managers have increasingly been using derivatives, in particular interest rate and currency swaps and futures. Changing debt duration via trade in derivatives is generally faster and might involve lower transaction costs than when using more conventional instruments such as buying back debt and issuing new debt. Also, auctions and buy-back operations might disrupt debt markets more than swaps.

16. Derivatives are also often used to hedge portfolio risks, including foreign currency risks. Moreover, as interest rate swaps allow separating the decision about the duration of funding from portfolio management, debt managers might want to increase the supply of government bonds of certain maturities so as to maintain or develop secondary market liquidity, while optimising the debt portfolios from the perspective of cost and risk management.

17. The use of derivatives by debt managers comes at the expense of introducing risks of its own and raising the complexity of debt management, requiring additional resources for analysis, execution and settlement (Blommestein *et al.*, 2008). Also, derivative trading creates counterparty risk which would need to be managed. This suggests confining transactions to exchange-traded derivatives. While collateralisation is increasingly common, it raises further issues of valuation. Moreover, lower-rated sovereigns might themselves need to offer collateral, raising the costs of using derivatives.

18. The lack of transparency in accounting of transactions in derivatives poses additional fiscal risks. It also creates opportunities to window-dress fiscal positions, as has been done repeatedly in the OECD area in the past (Piga, 2001). For example, interest rate swaps have been used to postpone interest payments for the sake of attaining deficit targets, implying large increases in interest payments in subsequent years. Comprehensive reporting about trade in derivatives is thus important. In particular, open positions and gains or losses would need to be recognised in government accounts.

A5. Impact of an increase in interest rates on government debt

19. Table A3 illustrates how the debt ratio changes with a permanent 1 percentage point increase of short and long-term interest rates. The calculations are done for a stylised economy with a real rate of growth and inflation in the baseline of 2%, and the cost of debt at 4% (see notes below Table A2) under two extreme scenarios of debt turnover and three different levels of initial debt. These parameters are stylised but correspond to projected characteristics of many OECD countries in the current decade. For the sake of simplicity, growth, the primary balance and the maturity structure do not react to higher interest rates.

20. In this setup, the interest rate shock increases the debt ratio after five years by between 0.8 percentage points, with low debt turnover and initial debt of 80% of GDP, and 3.5 percentage points, with high debt turnover and initial debt of 120% of GDP. After ten years the effect becomes more pronounced and reaches up to 9.5 percentage points in the latter case, but in the short term it is minimal with marginal variation across scenarios.

Table A2. Impact of a 1-percentage point increase in interest rates on the debt ratio

Accumulated additional debt over the baselline in percentage points of GDP

	Low debt turnover (average maturity of around 10 years)[1] with the initial debt ratio of:			High debt turnover (average maturity of around 2 years)[2] with the initial debt ratio of:		
After:	80%	100%	120%	80%	100%	120%
2 years	0.1	0.1	0.2	0.3	0.4	0.5
5 years	0.8	1.0	1.2	2.3	2.9	3.5
10 years	3.0	3.8	4.6	6.3	7.9	9.5

Notes: The baseline hypothetical scenario assumes that: *i*) initial assets (i.e. in the year prior to the interest rate shock – year t_0) are equal to 25% of GDP; *ii*) the implied cost of debt in year t_0 is 4.1%; *iii*) over the calculation horizon the primary balance is zero, nominal GDP grows at 4%, GDP deflator increases by 2%, the interest rate earned on assets is 2.3%, and long and short-term interest rates are 5.5% and 4.0%, respectively; *iv*) new debt (*i.e.* debt issued after year t_0) matures annually in proportions equal to the share of initial debt maturing from the 2nd year onwards (see notes 1 and 2 below); *v*) interest payments on initial debt are proportional to the implied cost of debt in year t_0 and the share of remaining debt in a given year; *vi*) interest payments on new debt start only after one year and in any given year they are proportional to interest rates in the year of issuance and the share of remaining debt; *vii*) interest rates on new debt depend on maturity – the short-term interest rate is paid on 1-year debt, the long-term interest rate is paid on 10-year debt and the linear combination of short and long-term rates is paid on debt of any other maturity. In the alternative scenario, short and long-term interest rates, but not the interest rate earned on assets, are increased permanently by 1 percentage point.

1. Low debt turnover scenario assumes the share of initial debt maturing in the 1st year of 10% and from the 2nd year onwards of 5%.

2. High debt turnover scenario assumes the share of initial debt maturing in the 1st year of 40%, in the 2nd and 3rd year of 25% and in 4th year of 10%.

Source: OECD.

A6. Eroding debt *via* inflation

21. Higher inflation lowers the debt level in real terms but it also increases the nominal cost of debt servicing when nominal interest rates are rising with inflation. The latter effect is gradual but faster with a higher debt turnover (*i.e.* shorter maturity). Whether the real cost of debt servicing rises or falls depends on whether nominal interest rates increase by more or less than inflation.

22. Table A3 illustrates how the debt ratio changes with higher inflation given different debt turnover assumptions. This exercise assumes a permanent inflation increase of 1 percentage point which is immediately and fully translated in all nominal interest rates for assets and for new debt. The calculations are done for a stylised economy that has initial debt and asset ratios of 100% and 25% respectively, with a real rate of growth and inflation in the baseline of 2%, and the cost of debt at 4% (see notes below Table A3). These parameters are stylised but correspond to projected characteristics of many OECD countries in the current decade. The assumed different debt repayment profiles attempt to reflect varied maturity structures in the OECD countries (Figure 2). For the sake of simplicity, the primary balance and the maturity structure do not react to higher inflation.

23. In this setup, the inflation shock lowers the debt ratio after ten years by between 5 percentage points (with high debt turnover) and 9 percentage points (with low debt turnover). This result is primarily driven by the decline in the real stock of debt and the delayed pass-through of higher nominal interest rates to the actual cost of debt, stemming from the assumed debt turnover parameters. It suggests that a sustained increase in inflation by 4 percentage points over a 10-year period would be required to erode the average crisis-induced increase in the debt ratio in the OECD area, which accumulated to around 30 percentage points between 2007 and 2011.

Table A3. Impact of a 1-percentage point increase in inflation on the debt ratio after 10 years with different debt turnover parameters

Per cent of GDP

The annual turnover of initial debt from the 2nd year onwards[2]	The difference between the alternative and baseline scenario in the debt ratio after 10 years[1]			
	The share of initial debt maturing in the 1st year			
	10%	20%	30%	40%
5 %	-9.2	-8.5	-7.9	-7.2
10 %	-7.8	-7.1	-6.5	-6.0
15 %	-6.7	-6.2	-5.8	-5.4
20 %	-6.2	-5.8	-5.4	-5.1
25 %	-5.8	-5.5	-5.2	-4.9

1. The baseline hypothetical scenario assumes that: *i*) initial debt and assets (*i.e.* in the year prior to the inflation shock – year t_0) are equal to 100% and 25% of GDP, respectively; *ii*) the implied cost of debt in year t_0 is 4.1%; *iii*) during the ten years after year t_0 the primary balance is zero, nominal GDP grows at 4%, GDP deflator increases by 2%, the interest rate earned on assets is 2.3%, and long and short-term interest rates are 5.5% and 4.0%, respectively; *iv*) in the first year of the inflation shock, initial debt turns over in the proportions indicated in the heading row, in subsequent years, it matures annually by a constant share indicated in the first column; *v*) new debt (*i.e.* debt issued after year t_0) matures annually in equal proportions as indicated in the first column; *vi*) interest payments on initial debt are proportional to the implied cost of debt in year t_0 and the share of remaining debt in a given year; *vi*) interest payments on new debt start only after one year and in any given year they are proportional to interest rates in the year of issuance and the share of remaining debt; *viii*) interest rates on new debt depend on maturity – the short-term interest rate is paid on 1-year debt, the long-term interest rate is paid on 10-year debt and the linear combination of short and long-term rates is paid on debt of any other maturity. In the alternative scenario, inflation (in terms of GDP deflator) and all interest rates are increased permanently by 1 percentage point over ten years.

2. For some combinations of maturity parameters, in the last year of debt life, the turnover share may be smaller than indicated.

Source: OECD.

A7. Financial assets

24. G10 countries differ considerably with respect to the level of general government financial assets. In 2010, the asset ratios were high in Japan and Sweden (above 75%), while in most of the remaining countries they were below the OECD average of 40% of GDP (Table A4). In part, sizeable asset levels reflect a response to the financial crisis, as financial assets in the government sector increased substantially due to the recapitalisation or takeover of financial institutions. Indeed, between 2007 and 2010 financial assets increased by between around 7 and 14% of GDP in Canada, Germany, the Netherlands, the United Kingdom and the United States (Table A4). For the EU countries in the G10, this is broadly consistent with the Eurostat data[21] (Figure A7).

25. Government financial assets consist commonly of securities, currency and deposits, loans and other assets. Shares of these categories vary considerably across the G10 countries (Figure A8). Total securities are the largest category for most of these countries, accounting on average for nearly half of total financial assets. They include mainly shares and other equity (on average below 40% of total assets) and securities other than shares, like bills, bonds and certificates of deposit, whose nominal value is determined on issue (on average 10% of total assets). Following the SNA convention, shares are valued at current market prices, and if those are not available they are estimated. Currency and deposits as well as loans – mainly long-term – each account on average for 13% of total assets. Other assets account on average for 25% of total financial assets. They include primarily financial claims that arise from timing differences between accrued transactions and payments made for items such as taxes, wages, interest, *etc*. In some countries

21. The Eurostat data in addition indicate that the purchase of shares and other equity primarily accounted for the increase in assets in Belgium, Italy, the Netherlands, Sweden and the United Kingdom, while Germany bought mainly securities other than shares.

trade credits and advances as well as monetary gold and special drawing rights (SDRs) held outside the central bank have a non-negligible share in total assets.[22]

Table A4. Financial assets

Per cent of GDP

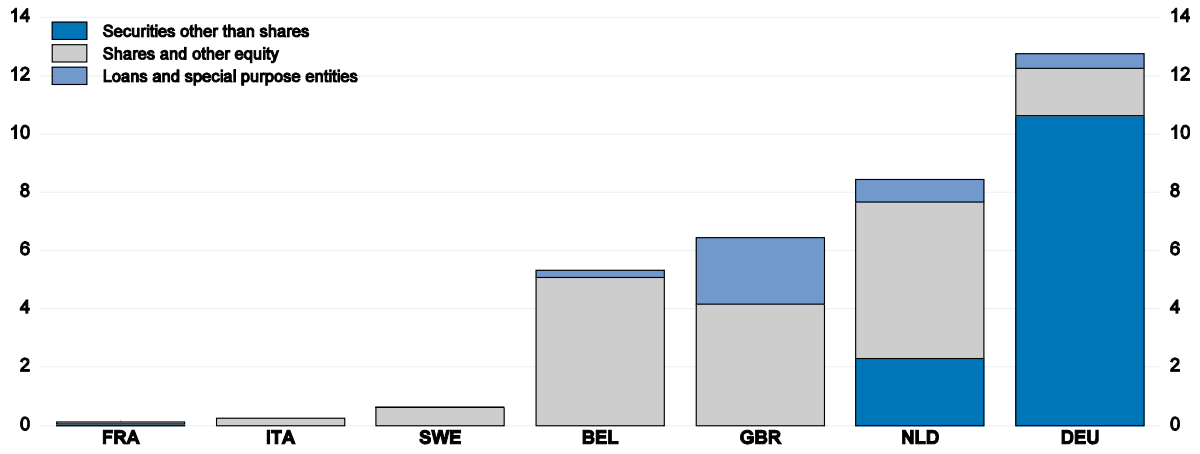
	Average for the:				2010	Change 2007-10
	1970s	1980s	1990s	2000s		
Belgium	21.1	19.9	19.8	15.9	20.0	5.1
Canada	38.1	32.2	32.1	42.0	53.8	10.2
France	32.3	28.1	26.0	31.8	37.5	0.0
Germany[1]	23.8	20.1	26.3	23.7	36.9	13.7
Italy	32.1	23.2	20.0	25.4	27.7	2.0
Japan	23.0	40.6	60.5	82.2	83.4	-2.2
Netherlands	36.9	49.6	42.1	27.8	36.8	13.1
Sweden	56.4	58.0	60.5	65.8	75.2	3.4
Switzerland	..	..	38.7	46.5	39.0	-6.9
United Kingdom	21.2	27.8	26.9	19.7	26.1	7.4
United States	14.0	16.9	18.1	20.2	26.3	6.9
Euro area	28.2	25.2	26.1	27.8	35.1	6.0
OECD	21.9	25.1	28.9	33.8	39.9	4.9

Note: 1. Prior to 1991 the Federal Republic of Germany only.

Source: OECD Economic Outlook 89 database.

Figure A7. Assets accrued due to governments' aid to financial institutions

2010, % of GDP



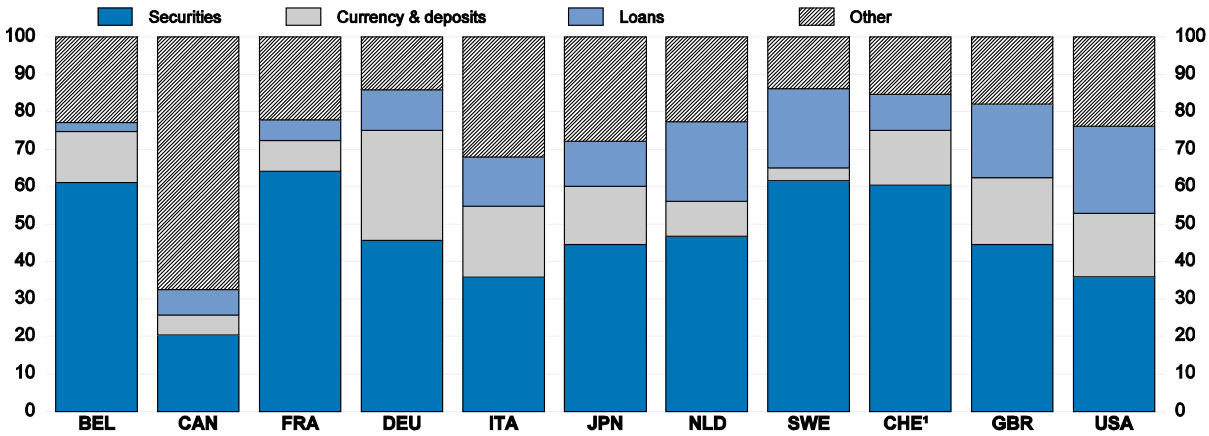
Source: Eurostat.

22. While the central bank is outside the general government sector, under some circumstances gold might be held within the government sector. This is the case for the United Kingdom (4% of total financial assets) and the United States (2% of financial assets).

26. The implicit rate of return on assets is an important parameter for analysing the impact of net interest payments on debt dynamics, which is determined by the difference between the rate paid on debt and the rate of return on assets. Calculating aggregate returns on financial assets is however surrounded by a large margin of error as flow data on asset returns are not always consistent with the asset stocks and are not always comparable across countries.[23] Moreover, variations in asset levels due to market price changes at the end of the year may affect the implicit returns on assets.

Figure A8. Composition of financial assets

2009, % of total financial assets



Note: Based on consolidated data with the exception of Japan and the United Kingdom where non-consolidated data are used.

1. 2008 data.

Source: OECD, System of National Accounts database.

A8. Non-financial assets

27. Non-financial assets are classified into two broad categories: fixed assets and non-produced assets. The former includes tangible fixed assets (residential and non-residential buildings, machinery and equipment) and intangible fixed assets (research and development[24] and computer software). Non-produced assets include primarily natural assets like land and natural resources.[25] Data coverage of non-financial assets is very patchy across OECD countries and across specific asset categories. Among the G10 countries, only France provides a full set of non-financial assets (Table A5). For most of these countries with sufficient coverage, non-financial assets are larger than financial assets (on average by 80%).

28. Data gaps for non-financial assets reflect frequently the fact that many governments still do not have an appropriate inventory. Diversified ownership of non-financial assets across various layers of government and institutions may reduce incentives for producing inventories that could be used to evaluate the best use of resources. Moreover, it is not straightforward to assign market values for non-marketable assets like military equipment for which there is no legal market (Elmendorf and Mankiw, 1998) or for land and parks

23. For instance in the *Economic Outlook* database, gross government interest receipts in Canada are approximated by total property income, including royalties from the exploitation of natural resources (amounting to around 1.9% of GDP over the past few years).

24. Research and development expenditures were recognised as a fixed asset for the first time in the 2008 System of National Accounts.

25. The 2008 SNA also included a new category of fixed asset referred to as land-improvements and so introduced the concept of produced land.

for which evaluation may require estimating opportunity cost based on adjacent use (Tanzi and Prakash, 2000). In addition, it is important to recognise that the valuation of some fixed assets, like software for example, typically reflects the costs of production net of depreciation and not necessarily the market price of the assets.

Table A5. Financial and non-financial assets

Per cent of GDP

	Belgium 2009	Canada 2009	France 2009	Germany 2008	Italy 2008	Japan 2008	Netherlands 2009	Sweden 2006	Switzerland 2008	United Kingdom 2009	United States 2009
Financial assets	20.3	55.0	40.4	25.4	25.3	77.6	37.8	76.4	40.8	28.4	24.5
Total reported non-financial assets	37.2	36.3	73.3	43.1	3.2	97.4	62.5	..	..	49.3	64.2
Fixed assets	..	36.3	47.0	43.1	..	70.5	62.5	..	..	..	64.2
Tangible fixed assets	37.2	36.3	46.5	42.9	..	..	62.1	..	..	49.3	63.8
Dwellings	0.0	0.9	2.8	1.2	3.2	..	0.6	..	..	0.4	2.3
Intangible fixed assets	0.1	..	0.5	0.2	..	..	0.3	..	..	0.0	0.4
Inventories	..	0.0	0.9	..	..	0.7	0.1	..	..	0.0	..
Non-produced assets	..	..	25.4	..	..	26.2	..	..	..	..	..
Tangible non-produced assets	..	..	25.4	..	..	26.2	..	..	..	..	..
Land	..	9.5	25.3	..	..	26.2	9.6	..	..	..	..
Intangible non-produced assets	..	..	0.0	..	..	0.0	..	..	..	..	..

Source : OECD, System of National Accounts database.

A9. The scope for reducing gross debt *via* asset sales

29. Table A6 shows three scenarios of gross debt reductions via asset sales for the G10 countries. The first assumes that all central government's securities as of 2009, including shares, are sold, the second that only central government's shares are sold, and the third one that the increase over the period 2007-10 in total general government financial assets is reversed. In general, for all countries but Sweden and Switzerland such sales would not be enough to reduce gross debt in 2009 to pre-crisis (2007) levels. As the asset decomposition data are not available for 2010, similar calculations cannot be done for 2010, but the situation seems to be even worse since in 2010 gross debt in many of these countries increased by more than assets. The scope for reducing gross debt would widen if non-financial assets were taken into consideration as well (Section A8).

Table A6. Stylised gross debt reductions via financial asset sales

Per cent of GDP, 2009

	Gross debt	Sales of central government financial assets			Unwinding of increase in general government financial assets 2007-10			
		Total	Total securities	Shares and other equity				
	(A)	(B)	(C)	(D)	(E)	(A)-(C)	(A)-(D)	(A)-(E)
Belgium	100	21	12	9	5	89	91	95
Canada	83	17	1	0	10	83	83	73
France	89	27	18	16	0	72	73	89
Germany	76	10	4	4	14	72	73	63
Italy	128	21	8	8	2	120	120	126
Japan	194	51	12	10	-2	182	184	196
Netherlands	68	31	17	14	13	51	54	54
Sweden	52	40	20	17	3	32	35	49
Switzerland	44	18	9	8	-7	34	35	51
United Kingdom	72	25	7	5	7	65	67	65
United States	84	10	2	1	7	82	83	77

Note: Total securities include securities other than shares, shares and other equity.

Source: Eurostat, Quarterly financial accounts for general government; and OECD, System of National Accounts.

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