

## PUBLIC DEBT: A SURVEY OF POLICY ISSUES

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### Introduction

The role, the limits and the effects of public debt have long been at the core of the fiscal policy debate. Public debt affects the allocation and distribution of resources and the stabilisation function of government. It reflects decisions taken by previous generations and it constrains those of future generations. History has seen numerous episodes of debt accumulation driven by different economic and political factors.<sup>1</sup> Debt decumulation via consolidation, inflation or default has frequently proved economically problematic and has produced significant political consequences.

The debate on public debt has involved economist, philosophers and policy makers, and has highlighted many, sometimes radically different, views.

Ricardo refers to the debt as “... one of the most terrible scourges which was ever invented to afflict a nation”, as “... a system which tends to make us less thrifty, to blind us to our real situation”.<sup>2</sup> He feared that the citizen initially “deludes himself with the belief, that he is as rich as before” and then, faced with the taxes levied to pay for the debt, is tempted “... to remove himself and his capital to another country, where he will be exempted from such burthens”.<sup>3</sup> Smith argued that government borrowing would deprive society of resources which could be invested more productively. He also noted that beyond a certain threshold debt inevitably leads to national bankruptcy.

However, classical economists were also well aware of the necessity of allowing borrowing in certain circumstances and of its usefulness in others. Building on such awareness, gradually the idea gained consensus that the public debt need not be repaid as it can be refunded and that “the problem of the debt burden is a problem of an expanding national income. How can a rapidly rising income be achieved?” (Domar, 1944, p. 166).

This paper aims at providing a concise overview of the main issues surfacing the debate over public debt. In Section 1 we review the main economic factors explaining the existence of debt from three perspectives: public finance, monetary policy and political economy. Section 2 takes a positive point of view and is dedicated to the definition of debt sustainability and to the analytical tools available

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<sup>1</sup> See Tanzi and Fanizza (1994) and Masson and Mussa (1995).

<sup>2</sup> In Sraffa (1951), p. 197.

<sup>3</sup> In Sraffa (1951), p. 247-8.

to undertake its assessment. Section 3 discusses the implications of high debt levels for the macroeconomic performance of the economy. Section 4 turns normative and considers market and rule-based mechanisms to control debt growth. Section 5 and 6 are devoted to more technical aspects concerning both analysis and policy: the former examines the issues arising when measuring public liabilities, the latter considers how fiscal rules and indicators can affect government debt management.

## 1. Why public debt?

In this Section we review the main economic factors explaining the existence of debt from three perspectives: public finance, monetary policy and political economy. The first two are normative, they suggest reasons why debt can be a useful tool; the third is positive and deals with factors driving recourse to deficit finance in practice and with the ensuing risks of excessive debt accumulation.

### 1.1 Public finance

The precept of a balanced budget, drawn by way of analogy from family finances, found a widespread endorsement well into the XX century as is witnessed by Pigou's 1929 writing: "in normal times the main part of a government's revenue is required to meet regular expenditure that recurs year after year. There can be no question that in a well-ordered State all such expenditure will be provided for out of taxation, and not by borrowing. To meet it by borrowing ... would involve an ever-growing government debt and a corresponding ever-growing obligation of interest. ... The national credit would suffer heavy damage; ... This thesis is universally accepted" (1929, p. 233).

However, even in family finance borrowing is not necessarily evil. Even classical advocates of the balanced budget were aware of the necessity of allowing borrowing in certain circumstances and of its usefulness in others. Therefore economists have had a hard job in trying to specify under what circumstances exceptions to the balanced budget rule were to be allowed and in striking the right balance between the risk of missing opportunities as a consequence of the constraint and the instability and wastes possibly caused by its removal.

Indeed the need for exceptions is clearly recognised by Pigou (1929). He deemed it to be plain that when "non-remunerative government expenditures *on a wholly abnormal scale* have to be undertaken, as in combating the consequences of an earthquake or to meet an imminent threat of war ... to collect what is required, and required at a very short notice in these conditions, through the machinery of taxation is politically and administratively impracticable" (p. 39; italics ours). He also argued that concerning "government expenditure devoted to producing capital equipment ... *the fruits of which will subsequently be sold to purchasers for fees* ... it is generally agreed that the required funds ought to be raised by loans. ... Upon this matter ... there is no room for controversy" (p. 36; italics ours). Finally, he

notes that "...since changes in taxation always involve disturbance, to keep the rates of taxation as nearly as possible constant from year to year ... it may be desirable ... to arrange a budget so that good and bad years make up for one another, *a deficit in one balancing a surplus in another*" (p. 35; italics ours).

However, allowing for exceptions to the balanced budget rule may open room for opportunistic behaviour (see Section 1.3). The theoretical soundness of the principles restricting government borrowing to fixed capital investment (the so called golden rule) can be questioned. The accumulation of debt either during recessions or in periods characterised by extraordinary negative events is justifiable not only to minimise distortions<sup>4</sup> but also for stabilisation purposes. The feasibility of an effective policy in this respect is not unproblematic.

Concerning the golden rule, clearly there are current expenditures, such as those increasing human capital, that can give a relevant contribution to growth as "indirect revenue need not come through a durable good" (Steve, 1972, p. 164; our translation). The dual budget (*i.e.*, the separation of current and capital operations) may result "... in a preference for expenditures on physical assets rather than greater spending for intangibles such as health or education" (Colm and Wagner, 1963, p. 125). Thus, "the need for a return, either in the limited financial sense or in the broader context of the social return, is a view that needs to be applied over a wider spectrum of public expenditures and not confined to capital budget only" (Premchand, 1983, p. 296). However, the inclusion in the capital account (which can be financed through debt) of all expenditures contributing to human capital would imply high deficit levels.

Deficit financing for stabilisation policy found early applications in Sweden and in the USA. In 1937 Sweden reformed its budget rules and abandoned the annual balancing. In Lindbeck's (1968) account, the Swedish reform was based on the idea that "in normal times the capital budget should be financed by loans whereas the current budget should be financed by taxes. In boom periods the current budget should, however, be overbalanced, hence part of the capital budget would be financed by taxes; in recession the current budget should be underbalanced, hence partly financed by loans" (p. 33). Hansen (1941) explains how in the USA, "President Roosevelt [...] expressed the hope that in times of prosperity current revenues would so far exceed ordinary expenditures as to produce 'a surplus that can be applied against the public debt'... The extraordinary expenditures, which are concerned with loans, capital expenditure and relief of need, he deemed to be sufficiently flexible in character as to permit their contraction and expansion as a partial offset for the rise and fall in the national income" (p. 219).

Support for the active use of deficit financing for stabilisation policy grew further in subsequent decades. However with the stagflation in the Seventies, deficit

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<sup>4</sup> Pigou's argument is the traditional tax-smoothing one: if governments determine tax rates on the basis of permanent spending, they can minimise the excess burden of taxation. Public debt would fluctuate in response to the transitory changes in revenue and expenditure. Barro (1979) finds that this model explains public debt dynamics in the USA since 1922. See also Flemming (1988).

finance lost momentum. Critics noted the difficulties concerning the estimate of the actual impact of budget changes on the economy and the risks of fine tuning given the lags between budgetary decisions and their effects on the economy. Theoretical models questioned the possibility for the Government to influence the level of government activity.

In the end, the debate lasting over two centuries has come to justifying government deficits under three set of circumstances: first, when non-remunerative expenses of a wholly abnormal scale have to be financed; second, for financing fixed capital formation; third, when the economy is under unfavourable macroeconomic conditions.<sup>5</sup> Thus from a strictly public finance perspective the existence of public debt is justified as the cumulated result of deficits incurred under the above mentioned circumstances. These factors should not normally justify large debts: exceptional, cyclical and tax smoothing considerations only justify temporary debt accumulation, while debt for capital formation is somehow limited by the fact that only net investment should be financed by borrowing.

## 1.2 *Monetary policy and financial markets*

While public bonds are primarily a tool for financing government, they are also relevant instruments for the development of financial markets and the conduct of monetary policy.

The development of the public bond market can contribute to creating a broad and efficient bond market which can improve the allocation of resources in the economy. In particular, it can help increasing the supply of long-term capital. The introduction of debt instruments which combine high liquidity with low risk can promote household saving (OECD, 1982 and 1993). When public debt is high or grows fast other, more problematic, effects come to the fore (see Section 3).

Government bonds also provide a low risk benchmark for financial markets, thus allowing greater portfolio diversification. This aspect can be particularly relevant for pension funds. If markets are incomplete, government can also increase welfare by introducing new securities that expand risk-sharing (Gale, 1989).

Public bonds can also be used to take care for the needs of specific groups of savers. For instance, government can provide inflation-proof savings instruments which financial institutions may be reluctant to offer (Bach and Musgrave, 1941).<sup>6</sup>

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<sup>5</sup> The first two set of circumstances may be especially relevant for local government where the tax bases can be especially small whereas, according to economic theory, stabilisation policy should be mainly managed by the central government. For a more detailed analysis of the role played by debt at the local level see Ter-Minassian (1997) and Ter-Minassian and Craig (1997).

<sup>6</sup> The role and implications of price-indexed bonds represent one of the most debated issue in debt management. This paper does not consider further the issue. See, for instance, Bohn (1988) and Calvo and Guidotti (1989).

Government bonds can also improve the effectiveness of the transmission mechanism of monetary policy. The presence of a low risk borrower issuing significant amounts of bonds at different maturities facilitate monetary authorities in regulating liquidity via open market operations.

In most countries public bonds are the main assets used in these operations. Lacking public bonds the monetary authorities would have to buy and sell private sector assets. This would imply decisions concerning the allocation of resources in the economy. In such a situation there might be pressures towards limiting the independence of monetary authorities (Gokhale, 2002).

### 1.3 *The political economy of public debt*

Economic theory points to some rationales for public debt, but both theory and experience suggest that debt accumulation also reflects political factors and that these can push the debt above prudent levels. This Section overviews the debate on the political economy of debt.

#### *The early views*

Taking at face value the exceptions allowed to the principle of the balanced budget one would think that the political economy of public debt was not a concern of the classical debate. That would be wrong: as we have seen in the introduction, Ricardo himself feared that debt would induce the citizen to delude “himself with the belief, that he is as rich as before”. Much later Puviani (1903) noted that politicians may prefer borrowing to extraordinary levies because citizens underestimate future interest burdens. In 1917 Pareto noted that “Public debt is one way of making acceptable for the citizens what they would not accept with the tax, and this effects is so great that any other considerations of ‘burden’ is secondary and negligible”.<sup>7</sup> Einaudi (1948) noted that while in general borrowing is to be preferred to taxation in funding extraordinary expenditures, this conclusion only holds if the expenditure level is held constant. Since borrowing can lead to greater spending, he concludes that “while *from a purely economic and financial point of view*, debt is to be preferred to taxation, *from a political point of view*, that is considering the political decision concerning spending, taxation is to be preferred to debt” (italics in the original text , p. 347).

Indeed the economists who elaborated the exceptions to the balanced budget principle were very much aware of the margins for opportunistic behaviour that they were opening.

Considering extraordinary finance United Nations (1951, p. 61) noted that margins for moral hazard and opportunistic behaviour arise as “the distinction

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<sup>7</sup> Pareto (1943), p. 135, as translated in Chiancone (1986).

between ‘ordinary’ and ‘extraordinary’ receipts and expenditure is admittedly not clear-cut, depending ultimately on the judgement of the classifying authority as to whether the receipts and expenditure in question are to continue indefinitely in the future”. De Viti De Marco (1953, p. 390, our translation) pointed out that “this subjective element does not allow to define a rigorous and objective rule that draws the line ... between ordinary and extraordinary finance”.

Also the distinction between current and capital items retains a certain degree of ambiguity which can be used opportunistically. “The classification procedures which are to be followed in separating “current” and “capital” transactions are among the most controversial and difficult questions in budgetary procedure, especially in view of the frequent abuses of so-called “capital budgets” in hiding deficits which otherwise would have become apparent” (United Nations, 1951, p. 11).

This scepticism was well grounded in experience. “In the case of France, the extraordinary budget was proverbially the dumping place for all expenditures which could not be balanced by tax receipts” (Hansen, 1941, p. 199). In 1945 Keynes notes that in the United Kingdom “the present criterion leads to meaningless anomalies. A new G.P.O. is charged ‘below’, a new Somerset House ‘above’. A Capital contribution to school buildings is ‘above’ in the Exchequer Accounts and is paid for out of Revenues, and is ‘below’ in the Local Authority Accounts and is paid for out of loans. The cost of a road is ‘above’, of a railway ‘below’. And so on”.<sup>8</sup> “In Canada, although not always realised even by Canadians, a budgetary distinction between ordinary and capital expenditures has been made ever since the confederation in 1867. The official reports show surpluses in fifty of the sixty-six years following 1867; but if the accounting were made on the United States basis, surpluses would appear in only fifteen of the sixty-six years” (Hansen, 1941, p. 199).

Concerning functional finance, the way in which it was first met is exemplified in the following passage: “If I were to pretend I could lay out a programme under which what I borrowed this year would be met by a surplus at the end of three years, everyone would soon perceive that I was only resorting to the rather transparent device of making an unbalanced budget look respectable”.<sup>9</sup>

All in all it can be argued that the relatively more recent strand of the literature analysing the politico-institutional determinants of government’s (possibly excessive) reliance on borrowing is well grounded in the tradition of public finance analysis.

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<sup>8</sup> Quoted in Clarke (1998), p. 65.

<sup>9</sup> Chamberlain, quoted in Sabine (1970), pp. 15-16.

*The recent literature*

Recent political economy models of debt can be grouped in six types of models based on:<sup>10</sup>

- (i) opportunistic politicians and naive voters with fiscal illusion (voters favour public spending but do not want to pay for it; they do not understand the government's intertemporal budget constraint, politicians take advantage of this and run deficits in order to win elections);<sup>11</sup>
- (ii) intergenerational redistribution (debt is a way of transferring resources across generations; current generations may exploit the fact that future generations do not vote when the decision on issuing debt is taken);<sup>12</sup>
- (iii) strategic use of debt by the current government (policymakers overissue debt so as to tie the hands of a possible successor with different preferences, in terms – for instance – of the level or the composition of public spending);<sup>13</sup>
- (iv) coalition governments (debt accumulation may be the result of delayed adjustment to an exogenous shock to the economy as a war of attrition takes place between parties which prefer to shift the burden of adjustment to supporters of other members of the coalition; the initial deficit itself may be endogenised in a model where parties with different ideological motivations coexist in a coalition government; this can be so even if all parties share a preference for a balanced budget);<sup>14</sup>
- (v) competition from dispersed interests (if spending decisions are decentralised and revenues are centralised but residually determined there may be a tendency not only to overspend but also to overborrow);<sup>15</sup>
- (vi) budgetary institutions (largely based on the idea that deficit bias is the result of a common-pool problem, a large empirical literature compares alternative budgetary institutions, both quantitative limits on fiscal variables and procedural rules and across political systems, and suggests that some institutions are correlated with smaller deficits).<sup>16</sup>

This literature offers some insight as to why countries in similar economic conditions may pursue different debt policies. It confirms the intuition of the earlier studies concerning the risk that myopic or opportunistic behaviour by politicians can result in unsustainable debt dynamics. It also points to the need to introduce rules and procedures restraining budgetary decisions (this aspect is examined in Section 4). However, historical experience shows that the role of these factors can

<sup>10</sup> See the reviews in Alesina and Perotti (1995), Drazen (2000) and Persson and Tabellini (2000).

<sup>11</sup> See Buchanan and Wagner (1977) and the papers in Buchanan, Rowley and Tollison (1986).

<sup>12</sup> See Browning (1975), Tabellini (1990, 1991), Cuckierman and Meltzer (1989).

<sup>13</sup> See Persson and Svensson (1989), Alesina and Tabellini (1990) and Tabellini and Alesina (1990).

<sup>14</sup> See Alesina and Drazen (1991) and Balassone and Giordano (2001).

<sup>15</sup> Velasco (1999).

<sup>16</sup> For European countries, see Von Hagen (1992) and Von Hagen and Harden (1994). For the USA see Alesina and Bayoumi (1996), Poterba (1994), Bohn and Inman (1996).

change across countries and time and that fiscal developments can be determined by many other factors (such as political ideologies, constitutional constraints and exogenous shocks).<sup>17</sup>

#### *Deficit bias and cyclical asymmetry in fiscal policy*

Evidence of a deficit bias, likely to be motivated by electoral motives or by myopia, is also provided by a different strand of the literature which investigates the actual reaction of public budgets to changes in macroeconomic conditions. According to European Commission (2001), between 1970 and 2000 "... [in the European Union (EU)] deficits did not fall during periods of high economic growth, implying that countries offset the working of the automatic stabilisers via discretionary tax cuts or, more frequently, expenditure increases; such fiscal relaxation in good times in turn necessitated a tightening during economic downturns" [p. 63].<sup>18</sup> If discretionary tightening in bad times exactly matches discretionary loosening in good times (*i.e.*, if fiscal policy, though pro-cyclical, reacts symmetrically to the cycle) then this tendency, though negative for the stability of the economic environment, would not imply that fiscal activism *per se* contributes to debt accumulation.

Some evidence of asymmetric behaviour is provided by Buti, Franco and Ongena (1998) for high debt EU countries where, between 1970 and 1990, deficit to GDP ratios are at around 6 per cent of GDP when output is close to or above its trend value while the imbalance increases up to 8 per cent when output falls below its trend level.

Buti and Sapir (1998) also find that in the same period, for the average of EU country, "when there is a moderately negative output gap [...] the actual deficit gradually increases" (even though the reaction to larger negative output gaps is not stronger) while "when there is a moderately positive output gap [...] the actual deficit remains stable" and it is only "when there is a strongly positive output gap [that] the actual deficit improves" (p. 87-88).<sup>19</sup>

Balassone and Francese (2004) test for the presence of asymmetry in the conduct of fiscal policy over the cycle in a sample of 16 OECD countries by estimating the output elasticity of public budgets separately for expansions and contractions. They find evidence that fiscal policy reacts asymmetrically to cyclical conditions as a downturn is usually accompanied by a deterioration of the budget

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<sup>17</sup> See Chiancone (1993), who provides a critical review of the political economy studies.

<sup>18</sup> See also Buti, Franco and Ongena (1997).

<sup>19</sup> This evidence is not uncontroversial. Melitz (2002) finds that "...[in EU countries] fiscal policy responded in a stabilising manner in all phases of the cycle but only mildly so" and points out that "...under expansion, the divergence [with Buti and Sapir, 1998] is important". Melitz (2002) also concludes that "...the explosion of debt/output ratios in the EU, and the OECD as a whole, must be explained independently of the cycle" (p. 235).



balance while an upturn does not entail an improvement of the balance. They also find that this asymmetry has significantly contributed to debt accumulation.<sup>20</sup>

## 2. The effects of public debt

The issue of the effects of public debt has been at the core of the fiscal policy debate over the last two centuries.<sup>21</sup> While the issue has been approached in different ways, the debate shows some recurring features.

### *Debt neutrality and debt burden*

The debate on the effects of the public debt goes back to the discussion on debt neutrality (*i.e.*, the equivalence of deficit and tax finance with respect to capital accumulation) and on the intergenerational distribution of debt burden.

Ricardo pioneered the field. He stressed that public borrowing reduces saving and this was for a long time the prevailing view. Against debt neutrality he argued that, due to fiscal illusion (*i.e.*, the inability of agents to correctly anticipate future taxes needed to finance the debt), debt induces a smaller reduction of consumption than taxes do; hence the former exerts a comparatively negative effect on capital accumulation.<sup>22</sup> Concerning the generational distribution of the burden of the debt Ricardo argued that the cost of debt is borne when resources are used.

Ricardo's position was taken up in the Forties by the so called "real resources view". According to the supporters of this view, the burden of the debt is borne by current generations as they pay the opportunity cost of financing it. The future servicing and repayment of the debt will only entail transfers from the general tax-payers to the bond-holders ("we owe it to ourselves"). As long as the debt is internally held, these transfers do not alter the overall volume of resources available.<sup>23</sup>

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<sup>20</sup> The average the debt to GDP ratio in their sample grows by almost 34 percentage points over the period considered (1977-2000), they estimate that almost a third of the increase is due to asymmetric budgetary behaviour.

<sup>21</sup> While this papers focuses on public debt, it is worth recalling that several studies evaluated the issue of the limits and implications of overall indebtedness (public and private). See Summers (1986) for an example concerning the US case.

<sup>22</sup> Between the end of the XIX and the beginning of the XX century, the "Italian school" of public finance explored further the conditions needed for debt neutrality to hold: Pantaleoni and Borgatta focused on the role of bequests; De Viti De Marco on financial markets imperfections; Griziotti on agents' time horizons; Puviani on bounded rationality and fiscal illusion. See, for example, De Viti de Marco (1953), Griziotti (1917) and Puviani (1903). See also the survey by Chiancone (1986). The neutrality hypothesis came to the fore again much later with Barro's (1974) contribution who put it into a fully formalised framework and highlighted the relevance of intergenerational altruism as an alternative hypothesis to the one concerning infinite time horizons.

<sup>23</sup> See Lerner (1943) and Chase (1943).

It was however widely recognised debt finance can affect the rate of capital accumulation and that if these effects are negative, future generations may be said to be burdened by the debt in the sense that they receive a lower capital stock.<sup>24</sup> It was also noted that the taxation required to finance interest spending introduces distortions in economic behaviour and involves a deadweight loss (Musgrave and Musgrave, 1984).

In the late Fifties the so-called “utility view” expressed new arguments against deficit finance.<sup>25</sup> The focus of the analysis was shifted from social to individual costs. According to this view, the burden of the debt falls onto future generations independently of the effects of debt on capital accumulation. Bond-holders have voluntarily given up resources now to have them back in the future so that their utility is not reduced; future tax-payers, on the other hand, will be forced to transfer (via the tax bill) resources to the bond-holders so that their utility will be reduced.<sup>26</sup>

#### *Debt and macroeconomic analysis*

The issue came to the fore from a different perspective in the Forties and Fifties in the context of the debate on the real balance effect. In commenting on the Haberler-Pigou proposition that changes in the real value of money balances can assure full employment by equating savings and investment at a positive interest rate, Patinkin (1948) noted that the base for wealth effects include the government debt held outside the treasury and the central bank. Tobin (1952) questioned this approach and argued that the additional taxes necessary to finance interest charges may reduce the value of private wealth.

The conventional view developed in the following years, in the context of the neoclassical synthesis, highlighted the long term effects of public debt (Modigliani, 1961). While in the short term deficits affect aggregate demand, in the long term they reduce savings, increase interest rates and reduce productive public capital formation (Diamond, 1965).

The Ricardian equivalence theory contrasted these views and pointed to the macroeconomic irrelevance of the debt/tax mix (Barro, 1974). The theory is based on the consideration that debt implies future taxes with a present value equal to the value of debt. Rational agents proceed as if the debt does not exist. This results in the debt having no effects on the economy.<sup>27</sup>

<sup>24</sup> See Pigou (1929). Also the supporters of the “real resource view” generally accepted this point.

<sup>25</sup> Buchanan (1958) labelled the view that the debt burden is borne immediately as the “new orthodoxy”.

<sup>26</sup> See Buchanan (1958), who labelled the view that the debt burden is borne immediately as the “new orthodoxy” and Bowen *et al.* (1960).

<sup>27</sup> Feldstein (2004) notes that further support to this thesis was provided in the Sixties by the new neoclassical theory of economic growth, arguing that the national rate of saving does not affect long term growth.

The debate that developed in the following years showed that Ricardian equivalence holds only if several conditions are realised. Buchanan (1976) claimed that fiscal illusion precludes the equivalence of taxation and debt. If future liabilities are not recognised, people behave as if bonds are a net addition to their wealth and increase consumption. Moreover, if individuals have finite horizons, they are not altruistic, they are liquidity constrained and they are uncertain about the future, the equivalence does not hold.<sup>28</sup>

### *Empirical studies*

Several studies tried to evaluate the empirical foundation of Ricardian equivalence. Buiter and Tobin (1980) concluded that the case for debt neutrality is not well established. Feldstein (1976 and 1998), while noting that the promise to pay social security benefits is equivalent to issuing bonds, argued that the empirical evidence concerning the effects of social security wealth suggests that the burden of the debt is shifted via lower saving ratios.<sup>29</sup>

While several studies rejected Ricardian equivalence,<sup>30</sup> other supported the prediction that debt and deficit have no effects on relevant economic variables.

Elmendorf and Mankiw (1998) examine the conventional view of the effects of public debt: debt can affect economic activity both in the short and in the long term. In the short term it increases aggregate demand, in the long term it reduces savings, increases interest rates and reduces productive public capital formation. Ball and Mankiw (1995) note that deficits also tend to reduce net exports and determine an outflow of assets.<sup>31</sup>

Auerbach and Kotlikoff (1987) provide similar indications within an overlapping generations model: in a closed economy in the long run an increase in public debt crowds out private capital nearly on a one-for-one basis.

Gale and Orzag (2002) survey the empirical work concerning the effects of budget deficits in the US and note that the studies that consider deficit expectations in addition to current deficits usually find significant connections between deficits and interest rates. They also note that, since an offsetting increase in private savings is unlikely, “long-term budget deficits reduce national savings and impose substantial costs to the economy, regardless of whether interest rates are affected. ... The reduction in future income is the true cost of a failure of long-term fiscal discipline.” (pp. 27-28).

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<sup>28</sup> Buchanan and Roback (1987) note that, even assuming that there is no fiscal illusion, there are no effects on consumption and saving only in the very unlikely case in which the fiscal operation involving the debt issue precisely balances off assets and liabilities in each individual's account.

<sup>29</sup> See also the extensive survey in Seater (1993).

<sup>30</sup> Holcombe *et al.* (1981).

<sup>31</sup> They estimate that the existence of the US debt reduces GNP by 3 to 6 per cent.

Tanzi and Chalk (2000) note that the availability of an income-generating risk-free asset may reduce the resources available to more risky investment options. This may raise the cost of capital for the private sector. They find that in the EU, contrary to Ricardian equivalence, higher debt puts upward pressure on interest rates and is negatively correlated with private investment. Moreover, higher debt is associated with higher tax levels and lower capital spending.

### *Distortions*

High debts may cause distortions in the economy and in public budgets.

The increase in tax burden deriving from higher debt levels is problematic if lump-sum taxation is not feasible and distortions and dead-weight losses cannot be avoided.<sup>32</sup> Tanzi and Chalk (2000) note that high debt countries have frequently introduced either regulations or special tax regimes aimed at channelling resources to public bonds. Some regulations have forced financial institutions or other agents to buy public bonds. These solutions reduce the interest burden on public bonds but introduce distortions in the capital market.<sup>33</sup>

Government investment spending may be especially affected by the need to keep the deficit under control arising in situations of high and rising public debt. This situation is conceptually equivalent to the introduction of a deficit ceiling and it can be shown that this implies a reduction in investment spending (Balassone and Franco, 2000b).

This may reflect three mechanisms. A first channel works through political economy considerations. Since investment produce deferred benefits policy makers, caring about economic performance only when in power, will invest if they can run deficits and avoid taxing the private sector, while they will avoid investment if its financing must come from taxes in order to keep the deficit under control.

A second channel may reflect a welfare maximisation strategy. Given an expenditure profile, the efficiency loss caused by distortionary taxation is minimised if the tax rate is constant (Barro, 1979). If a deficit ceiling is introduced indivisible investment projects will not allow tax smoothing and may be foregone in order to avoid the ensuing welfare costs.

Finally, since investments produce deferred benefits, the means of financing them (tax rather than debt) also affect inter-generational equity. Tax financing of

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<sup>32</sup> Elmendorf and Mankiw (1998) estimate that in the USA the dead-weight loss from servicing the debt is about 0.5 per cent of GDP.

<sup>33</sup> Aiyagari and McGrattan (1998) develop a model in which the optimum quantity of debt depends on the trade off between the benefits stemming from its role in smoothing out consumption and its costs in terms of crowding out capital and requiring distortionary taxation.

investment implies a welfare loss for the current generation and favours future ones: the former fully pays for a project whose benefits will partly accrue to the latter.<sup>34</sup>

While the results of the literature concerning the returns of public investment are not unambiguous, one can nevertheless argue that the decision to reduce capital spending should derive from considerations concerning these returns and not from the restraint imposed by high interest spending.

#### *Constraints to stabilisation policy*

High debt levels may discourage the use of the public budget as a stabilising device for the economy due to concerns over the sustainability of debt. According to European Commission (2001), this was the case in the past decades in the high-debt countries of the EU. These countries frequently had no room for their automatic stabilisers to operate.

Moreover, high debt levels may make deficit finance less effective. The effect of a fiscal expansion on consumption and investment may be reduced in the presence of high debt levels since the private sector is more likely to consider as unavoidable a subsequent compensatory action (e.g., a tax increase). Finally, high debt levels may imply that the effects of expansionary fiscal policy are offset by rising interest rates. It is likely that the effects on interest rates of large fiscal expansions, like the one undertaken by the USA since 2002 (about 6.5 percentage points of GDP), can be limited only if the initial debt level is low (it was 58.9 per cent of GDP in the USA at the end of 2001).

The rationale for having a debt target coupled with a medium term deficit objective in a monetary union can indeed be found in the recognition that in such a context national budgetary policies have an important role for macroeconomic stabilisation in the event of asymmetric shocks and across the economic cycle. The same considerations apply to the use of the public budget in the face of other shocks that would require public expenditure of a wholly abnormal scale, such as natural disasters or wars.

#### *The cost of debt reduction*

Large public debts have often determined problematic outcomes. A rising debt ratio may, at some stage, determine a confidence effect which leads to a sharp decline in the demand for public bonds and to a rise in risk premia. These risks are

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<sup>34</sup> The link between fiscal consolidation and cuts in capital spending is confirmed by the experience of EU and other OECD countries. See Roubini and Sachs (1989), De Haan *et al.* (1996) and Balassone and Franco (2000b).

greater when the debt is external. At this stage the government can either significantly improve the primary balance or default its obligations.<sup>35</sup>

While default is certainly a costly option, it must be borne in mind that the distortions mentioned above with reference to stabilisation and to capital spending are even more relevant when policy makers have to implement abruptly large fiscal adjustment packages. Significant welfare losses may also derive from changes in citizens' expectations. History shows that high debt situations can be brought to an end in many ways (Alesina, 1988). Each process has different redistributive impacts across economic agents and across generations.

### 3. Debt and sustainability

While there is a theoretical rationale for both allowing recourse to debt and to fear its excessive accumulation, there is no theoretical indication for a specific limit to debt accumulation.

Several studies have approached the issue of debt sustainability considering a specific question: are there limits to debt accumulation in the sense that it should be lower than a threshold above which its burden (as measured by the implied tax rate) significantly affects capital accumulation and growth?<sup>36</sup> The answer requires the specification of the equation governing the dynamics of the debt to GDP ratio as a function of budgetary policy (tax, interest and primary expenditure ratios) and of its effects on macro parameters as the rate of interest and the rate of growth.

Unfortunately there is no agreed upon theory of the interactions between the public budget and the economy. The only choice is to use a partial equilibrium framework, assuming that both the interest rate and the growth rate are exogenous to fiscal policy. The partial equilibrium nature of the exercise implies that the possible effects of growing debt on interest rates and growth are overlooked.

This type of analysis was pioneered by Domar (1944) to answer concerns that "... continuous government borrowing results in an ever rising public debt, the servicing of which will require higher and higher taxes; and that the latter will eventually destroy our economy or result in outright repudiation of the debt" (p. 148). Domar showed that a constant overall deficit to GDP ratio ensures convergence of both the debt to GDP ratio and the interest to GDP ratio to finite values. Consequently also taxes needed to service interest payments converge to a finite value as a share of GDP.

The debate on sustainability took a new twist in the Eighties, in connection with the growth of the public sector and the unfavourable demographic trends. It

<sup>35</sup> Default can take different forms. The government can inflate away the debt by raising money supply or devalue the currency (Ball and Mankiw, 1995; IMF, 2003). It can also formally repudiate its liabilities (Eltis, 1998).

<sup>36</sup> See the review in Balassone and Franco (2000a).

was spurred by estimates pointing to substantial prospective increases in public expenditure. The development of large welfare systems implied large scale implicit liabilities whose amount is related to the age structure of the population. The additional tax burden required to finance expected expenditure increases became the primary concern. The cost of implicit liabilities would in several countries dwarf that of outstanding public debt. In evaluating public finance sustainability it was no longer sufficient to examine the tax rate implications of a constant deficit, à la Domar. It became necessary to estimate the future deficit path implied by current policies.

However, from a formal point of view, Domar's definition of sustainability was still acceptable. Blanchard *et al.* (1990) proposed two necessary conditions for sustainability: (a) "... that the ratio of debt to GNP eventually converges back to its initial level ..." (p. 11); (b) that "... the present discounted value of the ratio of primary deficits to GNP ... is equal to the negative of the current level of debt to GNP ..." (p. 12).<sup>37</sup>

With respect to the necessary condition for sustainability used in Domar's paper (convergence of the undiscounted debt ratio to a finite value), the first definition in Blanchard *et al.* is tighter; but it is so at a cost of arbitrariness. Domar's model cannot specify the maximum sustainable debt level and Blanchard *et al.* do acknowledge that "... the justification for the ratio to eventually return to its initial level, as opposed say to zero, or to a higher but stable level, is, however, much less evident ..." (p. 11).

On the contrary, the second definition is looser than Domar's one: an ever-growing undiscounted debt ratio is allowed. As the authors explain, "... this is because of discounting, which implies that things far in the future do not matter much for today ..." (p. 14). However, as pointed out by Artis and Marcellino (1998), "... this suggests that both quantities should be analysed and not only the discounted one ..." (p. 6).

All three conditions have been employed in empirical studies on sustainability so that it is not always clear that different authors are talking about the same thing when they try to assess the "sustainability" of public finances.<sup>38</sup> The absence of a clear-cut theoretical benchmark to assess sustainability has often

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<sup>37</sup> Blanchard *et al.* (1990) treat the two conditions as equivalent (pp. 11-12). However, as the authors acknowledge (p. 14), there is a difference while the first condition implies the second, the latter is necessary but insufficient for the first to apply.

<sup>38</sup> Several studies tested the sustainability of past budgetary policies and shed light on the soundness of the hypothesis of Ricardian equivalence in macroeconomic modelling. Aschauer (1985) and Seater and Mariano (1985) tested the hypothesis that governments' receipts must equal expenditures in present-value terms jointly with a permanent income hypothesis. Hamilton and Flavin (1986) were probably first in testing the present value budget constraint *per se*.

favoured the use of *ad hoc* definitions.<sup>39</sup> The problem also affected the definition of European Monetary Union's (EMU) fiscal rules.

The sustainable level of public debt varies between countries depending on several economic and political features (IMF, 2003). It is usually higher for industrialised countries than for emerging market economies. The former have historically shown the capability to generate large enough primary surpluses to ensure the sustainability of their debt even in adverse circumstances. The latter have generally not gained this credibility. This is due to, for example, to weak revenue bases (with lower yields and higher volatility) and to less effective expenditure control during economic upswings (this is particularly the case in Latin America). However, among emerging economies there are significant regional differences, with Asian countries generally doing more to ensure debt sustainability than countries in other regions.

#### 4. Control mechanisms

The previous Sections have examined the factors that may lead to excessive debt accumulation and the consequences of this accumulation. This Section considers the mechanisms which can control debt expansion. Two issues are considered: can the financial market restrain debt growth? If rules are deemed necessary, which rules should be adopted?

##### 4.1 Market

Default premia and credit constraints clearly have the potential for disciplining irresponsible sovereign borrowers. Default risk is priced by the market. Thus market-based fiscal discipline would initially take the form of a rising default premium on the debt of a country running excessive deficits. If these deficits persist, the default premium would increase at an increasing rate until, eventually, the offending country would be denied access to additional credit. The increase in the cost of borrowing, along with the threat of reduced availability of credit would then provide the incentive to correct irresponsible fiscal behaviour. The key question is whether and under what conditions credit markets restrain irresponsible borrowing and thus irresponsible debt accumulation.

Lane (1993) identifies the following necessary conditions to be met for the market to be effective: a) no government unit should have privileged access to the market; b) the market must have access to all the information necessary to evaluate the financial reliability of each unit; c) the bailing-out of troubled government units must not be allowed.

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<sup>39</sup> We are leaving aside the issue of external debt sustainability. This is especially relevant for less developed countries and emerging market countries (see Chalk and Hemming, 2000 and IMF, 2003 and the references therein).



If any of the three conditions above is not met, market signals risk too late and the change in market perception of the state of government finances may change too suddenly with possibly disruptive consequences.

The possibility to rely on market-induced fiscal discipline was considered when defining the conditions to be met by a country for joining EMU. At that time it was pointed out that the expectations of a partial bail-out would be sufficient to make the fiscal stance of governments insufficiently reflected in credit risk premia (e.g., Lamfalussy, 1989, and European Commission, 1990). Moreover, accounting practices for general government accounts – even in national accounts – provided further obstacles to effective risk assessment by market agencies and investors. Finally, it was argued that the international evidence on sovereign defaults suggested that “constraints imposed by market forces might either be too slow and weak or too sudden and disruptive” (Committee for the Study of Economic and Monetary Union, 1989, 24). In the end, regulation was seen as a necessary supplement to market forces.

The crisis in which the Stability and Growth Pact has plunged in 2003 may induce to reconsider the issue today. As to the three conditions laid down by Lane, it is fair to say that government’s privileged access to the market was never an issue (the European Central Bank is independent, and financing of governments is no longer possible), but the other two conditions remain problematic. Some problems remain open with reference to the information available to market agents on government finance. Nevertheless, this information has greatly improved thanks to the statistical requirements provided for by the Treaty and the Stability and Growth Pact and the consequent markedly increased homogeneity of available accounts. Also the credibility of the no-bail-out commitment still remains an open issue at least for large highly indebted countries playing a major role even in the large European financial market.

Recent empirical work confirms the conclusions concerning the role of market incentives reached at the end of the Eighties. Rating can help but also seems to react slowly (Balassone, Franco and Giordano, 2004). In this regards, FitchRatings (2004) observes that it is unlikely that financial markets can give a strong incentive for fiscal discipline to euro-area sovereign borrowers, since “a euro-area government whose budgetary position weakens is likely to have to pay more for its debt, but that extra cost will be small.”

#### 4.2 *Rules*

Regulation may support the market in providing proper incentives for fiscal discipline. Indeed rules are used in most countries.<sup>40</sup> Budgetary institutions may be partitioned in two broad categories: legislated quantitative limits on fiscal variables and procedural rules.

<sup>40</sup> See Kopits and Symansky (1998) and the papers in Banca d’Italia (2001).

In order to restrain debt growth, one may consider either rules directly setting a limit to debt levels or rules controlling debt levels via limits to deficit levels.<sup>41</sup>

In practise, quantitative limits to the stock of debt are rare: budgetary institutions usually aim at controlling the deficit. This is so essentially because governments can take decisions concerning the yearly deficit while the stock of debt reflects the budgetary decisions taken in past years. Moreover, a ceiling on debt would only constrain policy makers once the debt level comes close to it; at that stage the needed correction may be too large to be politically viable and the ceiling itself may have no credibility. By the same token, the credibility of a debt target set when the current stock is already too high hinges upon a sustainable path of fiscal consolidation. Therefore either there are no explicit limits to the debt level or when quantitative limits to debt are used, they are usually accompanied by deficit rules.

Lower levels of government are frequently subject only to deficit restrictions. In some countries, fiscal targets are specified by the law; in others, they are the outcome of budgetary procedures in which both cooperation and controls may be present. Administrative controls can also be used.<sup>42</sup> Balanced budget requirement are frequently applied. In federal countries and in countries characterised by a high degree of decentralisation, recourse to debt is generally permitted to any government tier. The rules generally limit the overall size of the deficit (either directly, or indirectly via thresholds for interest outlays) and allow indebtedness for certain purposes only (usually public investment). The constraint on indebtedness generally applies *ex ante*: possible overshoots may be compensated for in subsequent financial years. Further budgetary flexibility is sometimes provided by the so-called rainy-day funds.<sup>43</sup> In the latter case, gross and net debt positions can significantly differ.

These restrictions tend to be less common for sovereign governments. However, where there are no numerical deficit limits, the nature of the budgetary process (*i.e.*, the system of rules and regulations, both formal and informal, which determine fiscal decisions) is extremely important in determining the size of deficits. Empirical research has indicated that deficit levels tend to depend on the power of the Treasury Minister, on the government's ability to enact supplementary budgets during the fiscal year, on the power of the executive to enforce the original budget and on the role played by amendments on budgetary procedures.<sup>44</sup>

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<sup>41</sup> Spaventa (1987) considers whether a fiscal rule respecting the government's intertemporal budget constraint is sufficient for ensuring the sustainability of fiscal policy. He concludes that, since the debt ratio can rise to very high levels, the constraint is not sufficient when the size of the debt can affect the interest rate or there is a limit to the tax burden.

<sup>42</sup> See Ter-Minassian and Craig (1997), Banca d'Italia (2001) and Balassone, Franco and Zotteri (2004).

<sup>43</sup> For example, this is the case in the USA. For a detailed analysis, see Knight and Levinson (1999) and McGranahan (1999).

<sup>44</sup> See von Hagen and Harden (1995) and Ferejohn and Krehbiel (1987). From an empirical perspective, von Hagen (1992) builds up an index of the institutional characteristics of the budgetary process in EU countries which accounts, *inter alia*, for the strength of the prime ministers in budget negotiations, limits to amendments, budget voting process, the degree of transparency. He finds that, in the Eighties, countries with an high index value were those with lower deficit and debt levels.

Other countries adopt a golden rule approach. In Germany, for instance, yearly deficits are allowed up to the level of gross investment in the federal budget.<sup>45</sup> In the UK, legislation providing for the net public debt as a proportion of GDP to be held at a stable and prudent level over the economic cycle (this level is currently set at 40 per cent) is accompanied by a golden rule requiring that, over the economic cycle, the government borrow only to invest.<sup>46</sup>

In the USA a statutory limit on federal government gross debt is in place since 1917.<sup>47</sup> However Buchanan and Wagner (1967) note that the legal status of the debt limit is not clear, since the excess of appropriations over revenue collections might require debt creation in conflict with debt legislation. Over recent years this limit has been supplemented by several rules concerning the budget balance and public spending (Peach, 2001). After the failure of the 1985 Gramm-Rudman-Holling Deficit Reduction Act to attain the set budgetary targets,<sup>48</sup> the possibility of introducing a balance budget principle in the Constitution was discussed.

EMU provides an interesting case of fiscal rules aimed at controlling both debt and deficit levels and of the ensuing problems.<sup>49</sup> The Treaty of Maastricht in 1992 stated that gross debt must be below 60 per cent of GDP or, if above that level, it must be decreasing at a satisfactory pace and that the deficit must not exceed 3 per cent of GDP, unless exceptional circumstances apply. In 1997, with the Stability and Growth Pact, budgetary flexibility was explicitly pointed out as an objective to be achieved along with fiscal soundness. The Pact spelled out the circumstances that may allow a deficit above 3 per cent. At the same time it introduced a medium term target of a position close to balance or in surplus, which is now interpreted in cyclically adjusted terms. In this way the Pact both tightened the Treaty's deficit rule and tried to reconcile it with the possibility of counter-cyclical fiscal policy. However the Pact left the Treaty's rule on debt somewhat at the back of the picture. It did not specify how the requirement of a satisfactory pace of reduction was to be interpreted in practice.<sup>50</sup> As a result the focus of the debate concerning the assessment of public finance conditions in EMU countries was strongly biased towards the deficit.

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<sup>45</sup> Art. 115 of the Constitution states that: "Borrowing cannot exceed the total investment expenditure in the budget; exceptions are only allowed to avoid disturbances to the overall economic equilibrium". The items mentioned partly differ from those considered in national accounts.

<sup>46</sup> See HM Treasury (1998a) and Kilpatrick (2001).

<sup>47</sup> See Peach (2001).

<sup>48</sup> See Gramlich (1995).

<sup>49</sup> The economic policy framework of EMU is extensively examined in Buti and Sapir (1998), Buti, Franco and Ongena (1997) and Brunila, Buti and Franco (2001).

<sup>50</sup> Indeed the requirement to keep the debt ratio declining could prove to be inconsistent with the attempt at providing budgetary flexibility along the cycle (Balassone and Monacelli, 1999). This concern is perhaps one of the rationales for the requirement that the debt stays below 40 per cent in the UK's fiscal framework to apply only over the length of the economic cycle rather than on an annual basis and to develop a cyclically adjusted measure of debt (HM Treasury, 2002).

More recently, in the context of a debate on the rationale and the effectiveness of EMU's fiscal framework,<sup>51</sup> several proposals have been put forward to give more weight to debt. Recently the ECOFIN (2001), the Economic Policy Committee (2003) and the European Commission (2003) have reaffirmed the importance of debt in fiscal surveillance by stating that the assessment of countries' public finances must take account of the need for a rapid decline in debt among those countries which have high debts and that greater weight must be attached to debt over future years. Several specific proposals to differentiate the rules applying to countries on the basis of their debt levels and medium-long term fiscal prospects have been put forward.<sup>52</sup> While greater reference to the debt ratio does not raise measurement problems, reference to implicit liabilities is more problematic: long-term estimates are subject to considerable uncertainty related to the macroeconomic, demographic and behavioural scenarios (see Section 5.1).

The twin track approach of setting both a deficit and a debt constraints seems reasonable also in view of implementation problems (see IMF, 2001).

First, deficit controls are effective in restraining debt dynamics only if the reference deficit measure is a comprehensive one (see Section 5). A maximum debt reference level can therefore be a useful companion of deficit-based rules because it compensates for possible shortcomings of the deficit measure. Moreover, if deficit rules are defined as ceilings, a prudent debt reference level can help avoid the deficit is kept constantly close to the ceiling.

Second, although targets for the debt ratio may install incentives for governments in the long term, there may be some room for manipulation, via, for example, sale-and-lease-back operations. Moreover, it cannot be taken for granted that deficits do not matter if debt levels are under control. In the context of EMU, for example, high deficits may negatively affect the possibility to attain a good policy mix.

## 5. Measuring public liabilities

The effectiveness of rules crucially depends on the indicators they refer to.<sup>53</sup> Not only has the indicator to be relevant in view of the purpose of the rule, it also has to be based on a transparent and unambiguous operational and statistical framework. Experience highlights the possibility that policy-relevant indicators can be manipulated. It also points to the dangers inherent in statistical frameworks allowing for different interpretations of accounting rules.<sup>54</sup>

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<sup>51</sup> See Buti, Eijffinger and Franco (2003) for a critical review of the debate.

<sup>52</sup> See Buti *et al.* (2003), Pisani-Ferry (2002), Wren-Lewis (2003), Wyplosz (2003), HM Treasury (2004).

<sup>53</sup> See Balassone, Franco and Zotteri (2002).

<sup>54</sup> See Balassone and Franco (2001).

In particular, public debt can be defined in many different ways, depending on the sector of reference and the liabilities to be considered. As in the case of other fiscal indicators, the choice depends on the policy purpose of the indicator as well as on operational considerations. This Section examines the main methodological aspects concerning the measurement of public liabilities in general (Section 5.1) and with specific reference to the EMU context (Section 5.2).

### 5.1 *From financial debt to overall fiscal liabilities*

First of all, the sector of reference should be defined. In principle, the definition should include all the public bodies whose financial behaviour has an impact on government finance and ultimately on taxpayers. All levels of governments and other public bodies, such as social protection institutes, should be considered. In practice, there is a grey area, which regards, in particular, public enterprises (Levin, 1993; Stella, 1993).

Second, the relevant liabilities should be defined. One can choose between gross and net measures, face values and market prices, financial debt and a broader definition including non-financial debt. The latter can include current non-financial liabilities (e.g., taxpayers' credits, public guarantees, etc.) and also perspective budget liabilities, such as the pension rights granted by pay-as-you-go (PAYG) schemes. The following subsections examine these issues moving from the more traditional definition of public debt to broader definitions.<sup>55</sup>

#### *Financial liabilities*

Public debt has been traditionally defined as the sum of financial liabilities issued by all government levels.<sup>56</sup> The assets owned by governments are not usually deducted. This definition reflects practical considerations: financial liabilities can be timely and accurately estimated while the assessment of assets is sometimes problematic.

The gross debt definition overlooks the fact that assets owned by government can be sold to repay the debt. A net debt measure represents a better benchmark for assessing fiscal sustainability. However, this solution raises some difficulties: first, the degree of liquidity of government assets should be taken into account; second, data on assets are often subject to significant uncertainty, especially those on non-interest bearing assets.

These considerations may suggest relying both on a gross and a net debt definition is preferable. The former is more precise, more timely available and more relevant over the short term, the latter is more economically relevant in a longer time perspective.

<sup>55</sup> See Blejer and Cheasty (1993), Kopits and Craig (1998) and Premchand (1995).

<sup>56</sup> The liabilities issued by a public body and owned by another public body are netted out.

The issue of valuation can be addressed from different points of view. For governments, market valuation is not the relevant measure. It refers to the sum the government would be asked to pay if it were to buy back its debt before it falls due, but the government has no obligation to do so. In evaluating its solvency, therefore, the relevant price is the one to be paid when liabilities fall due. Furthermore, reference to market values makes the debt measure extremely volatile.<sup>57</sup> For investors, the market value of government liabilities matters only in so far as they intend to sell or buy such liabilities on the market. However, in evaluating government solvency, also investors should look at redemption values.

Once the debt measure has been chosen, the deficit should be defined accordingly, *i.e.*, in such a way as to take into account all transactions determining a change in debt. If the debt is gross, the deficit should reflect both non financial transactions and financial transaction in assets.

#### *Government net worth*

In recent years some studies have extended the analysis to a broader view of the government balance sheet, considering both public assets and other explicit or implicit liabilities. These developments are closely related to several theoretical studies that have pointed to the deficiencies of conventional cash-flow deficit measures in the assessment of fiscal impact and of budgetary sustainability. As to the latter, it has been suggested that conventional accounting methods do not allow to adequately monitor and control the government's overall fiscal position.

In order to overcome these difficulties it has often been prescribed to resort either to "economic deficit" or to "government net worth".<sup>58</sup> These definitions would consider public assets and all "contingent liabilities".<sup>59</sup> A contingent liability can be defined as a public sector action that determines a cash expenditure only if and when a certain event takes place. Contingent liabilities may emerge either from the government involvement in the economy (guaranteeing the debt of public enterprises or deposit insurance) or from its commitment to provide services or other transfers in the future.

The inclusion of future spending commitments is consistent with the forward looking nature of sustainability analysis, which cannot be based on "point-indicators" which only depict the current budgetary situation (Balassone and

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<sup>57</sup> If a net measure of debt is used, symmetry would require that assets be valued in the same way as liabilities. However, an argument for market valuation of assets in any case could be made, based on the consideration that they can only be sold at market prices.

<sup>58</sup> See, respectively, Kotlikoff (1984) and Buiters (1983). For a critique see Mackenzie (1989). For a survey see Towe (1991) and Blejer and Cheasty (1991).

<sup>59</sup> Both these solutions would require, for instance, the inclusion of pensions in fiscal accounts when obligations arise rather than when the actual payment is made. In order to evaluate economic deficit, contributions to public PAYG schemes would have to be classified as a financing item, while pensions would be considered as a loan repayment or as an interest payment. Any change in the present value of pension liabilities would immediately influence government net worth.

Franco, 2000a). The assessment of future developments can refer either to long term projections of public expenditure or to summary indicators of these projections.

From the mid-Eighties an increasing number of studies have examined the long-term prospects for public budgets.<sup>60</sup> These studies usually focus on those public expenditure items which are particularly dependent on the population age structure (such as pension, health, education) and seek to assess the likely change of these expenditure on GDP. While several economic, political and social factors can obviously affect the dynamics of per capita transfers and services, the studies examining the prospects of age-related expenditure usually focus only on two rather specific factors: the effects of changes introduced in legislation, but not yet embodied in present expenditure profiles, and of structural expenditure trends. These two factors are considered because they are consistent with a constant policy approach: the estimates define the liabilities embodied in current policies.<sup>61</sup>

Summary indicators of the outcomes of long-term projections have been proposed to "... summarise their results through a single number which comes as a simple metric, allowing for a simple interpretation of the result ..." (Blanchard *et al.*, 1990, p. 32). Buiters (1985) suggests to use the difference between the current primary deficit and the one that would allow a constant net worth to GDP ratio. Blanchard *et al.* (1990) define the tax gap as the difference between the current tax rate and the one that would guarantee that the debt ratio comes back to its initial level over a specified period. Summary indicators of "... the fiscal burden current generations are placing on future generations..." (Auerbach *et al.*, 1991, p. 55) are provided by generational accounts, the most recent product of a line of research criticising traditional point indicators, based on long-term projections of fiscal variables appearing in the general government present value budget constraint.

In general summary indicators meet the same difficulties as straightforward long-term projections. In addition, it may be noted that they do not provide information about the timing of the effects of demographic changes. Concerning generational accounting, moreover, the interpretation of results is not intuitive. This may hamper their use for policy purposes.<sup>62</sup>

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<sup>60</sup> See Franco and Munzi (1996) and Franco and Marino (2004) and the references therein.

<sup>61</sup> The most basic approach provides estimates of the effects of demographic changes on public expenditure under the assumption that age-related per capita expenditure levels remain constant either in real terms or in per capita GDP terms at the initial level over the projection period. In other words, it is assumed that present standards of transfers and services are maintained for all population age-groups and that there is no behavioural response from governments and households to demographic changes.

<sup>62</sup> For a critical assessment of generational accounting, see, e.g., Buiters (1995), Hagemann and John (1995), Haveman (1994) and IMF (1996). The main problem specific to generational accounting is the upward bias its methodology induces in the assessment of the effort needed to ensure solvency due to the different treatment of fiscal variables, to the different rules applying to present and future generations and to the fact that future effects of legislative changes already introduced are not taken into account.

### *Pension liabilities*

The issue of contingent liabilities is particularly relevant for pension schemes. In recent years a number of studies have estimated the liabilities of PAYG pension schemes<sup>63</sup> and have argued that these liabilities should be taken into account when evaluating the state and the perspectives of public finances.<sup>64</sup> It has been claimed that “the strains that higher dependency ratios will impose on budget policies can be seen by examining the present value of future net liabilities of the pension systems in the major industrial countries.” (IMF, 1993, p. 56).

Estimates of pension liabilities may represent a useful complement to conventional debt and deficit measures.<sup>65</sup> However, the ratio of accrued pension liabilities to GDP is not an indicator of pension schemes’ sustainability:<sup>66</sup> a high liabilities to GDP ratio does not necessarily imply an imbalance in PAYG pension schemes; nor does it imply that an imbalance will occur in the future. Any judgement about the sustainability of pension schemes and the pressure they exert on public budgets requires estimates about the resources available to pay for the accrued pensions, namely about the evolution of employment and per capita income.<sup>67</sup> The sustainability issue should be addressed with other indicators, such as the pension expenditure to GDP ratio and the contribution rate that assures the cash balance of pension schemes.

There are practical as well as theoretical reasons not to include accrued pension liabilities in the deficit and debt statistics used in defining and evaluating fiscal policy. Pension liabilities are uncertain and depend on the specific assumptions adopted upon a variety of factors. Pension rights are not embodied in formal contracts and are not tradable (the debtor can modify both the timing and the amount of the payment even taking individual characteristics into account).<sup>68</sup>

### *5.2 Monitoring debt trends: the case of EMU*

The reference accounting framework for EMU rules is specified in the Protocol on the excessive deficit procedure. Eurostat oversees the correct

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<sup>63</sup> See Van den Noord and Herd (1993 and 1994), Kuné *et al.* (1993), Hagemann and Nicoletti (1989), Hills (1984), Beltrametti (1993) and Rostagno (1995).

<sup>64</sup> See Van den Noord and Herd (1993), IMF (1993), Hoffmann (1993) and Castellino (1985).

<sup>65</sup> They provide a measure of the cost of terminating PAYG pension schemes when complying fully with present benefits rules.

<sup>66</sup> See Franco (1995).

<sup>67</sup> Critical to such estimates is the assumption that revenue cannot be increased proportionately to the expected growth of expenditure. Indeed, the basis for estimating the net present value of the implicit debt measures is the difference between the expected growth of expenditure and revenue under a constant policy scenario (Heller, 1986).

<sup>68</sup> These problems are even more important when referring to other social benefits, such as medical care, education and welfare benefits. It may be debatable to what extent the government is legally obliged to meet such potential obligations and what is the quality and quantity that is to be taken into consideration in the estimates (Heller *et al.*, 2003).



implementation of definitions and computational criteria by national statistical institutes and releases explanatory notes concerning controversial issues.

In this accounting framework, the deficit is identified with net borrowing as defined in the European System of Integrated Economic Accounts (ESA).<sup>69</sup> The debt is defined as gross financial liabilities at nominal (face) value consolidated between and within the sectors of general government. Although the debt measure is not defined in ESA, the relevant financial instruments are those specified within that framework.

EMU statistical indicators can be assessed both with respect to the objective of fiscal soundness pursued with fiscal rules<sup>70</sup> and with respect to the margins for interpretation allowed for by the underlying operational and statistical framework (transparency).

With respect to the objective of fiscal soundness, reference to a gross measure of debt seems in line with sustainability analysis, although net debt would provide an important complementary information (see Section 5.1). Reference to nominal value does not seem appropriate as it does not always coincide with redemption value, which is the relevant measure for assessing sustainability (see Section 5.1).<sup>71</sup> Moreover EMU rules are based on traditional point indicators; the support role to be played by long term projections is not sufficiently specified.<sup>72</sup>

As to transparency, while reference to a predetermined and independently defined statistical protocol is a positive trait of EMU's framework, the deficit and debt measures adopted are not mutually consistent (*i.e.*, the ESA95 deficit is not the flow concept corresponding to changes in the stock of gross financial liabilities), which is a clear *vulnus* to transparency.

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<sup>69</sup> ESA is a predetermined and independently defined protocol. This represents a significant advantage in terms of transparency (especially in a context where international comparison is crucial); nevertheless no protocol can be detailed enough to specify the intended meaning of its provisions with respect to all possible circumstances. This implies that *ad hoc* decisions have to be reached when countries introduce new accounting operations. At times compromise solutions are introduced. However, the need to adopt solutions with an *erga omnes* validity has contributed to limit the number of *ad hoc* exceptions and adaptations.

<sup>70</sup> EMU fiscal rules were designed to preserve a sound fiscal stance and to allow for budgetary flexibility in the face of adverse circumstances. Here we focus only on the first objective for which debt dynamics matter most. Indeed, the use of both a deficit and a debt measure can be problematic from the point of view of the flexibility target (see Section 4.2).

<sup>71</sup> One example is the valuation of Italian Post Office Deposit Certificates whose nominal (face) value does not include accrued interest which will have to be paid at withdrawal of funds (similar bonds are issued in Portugal). Market valuation (the criterion adopted in ESA95) would not represent a satisfactory solution. Market valuation refers to the sum the government would be asked to pay if it were to buy back its debt before it falls due, but the government has no obligation to do so. Furthermore, reference to market values would make the debt measure extremely volatile.

<sup>72</sup> The need for a forward-looking assessment of the budgetary situation is somehow taken into account in the Excessive Deficit Procedure which foresees the submission by member-states of multi-year programs including medium-long term projections whose internal consistency, underlying assumptions and, ultimately, attainability are subject to scrutiny. Long term projections are receiving increased attention in the monitoring of budgetary trends (section 4.2).

The deficit indicator accounts only for real transactions and is mainly based on accrual accounting, while the debt indicator also accounts for the impact of financial transactions and is based on cash accounting. Moreover, two other factors may create a gap between the deficit and the change in the debt level: (a) exchange rate fluctuations affect the whole stock of foreign currency denominated assets and liabilities (they determine a change in net debt) but are not reflected in the deficit as this is only concerned with actual transactions; (b) different accounting conventions are adopted for recording the effect of transactions on stocks and on flows with respect to liabilities not issued at par and to liabilities denominated in foreign currency.<sup>73</sup>

The difference between the change in the debt and the deficit measure chosen for EMU rules was by no means negligible over the Nineties; the yearly average for EU countries between 1992 and 2001 was almost 1 per cent of GDP.

This leads to a problem with reference to debt sustainability because of the inconsistency between the deficit and the debt indicators. Indeed, compliance with the deficit rule not only does not guarantee compliance with the debt rule but also it is, in principle, compatible with any debt dynamics. Since the deficit rule is somewhat more important, more binding and more “operational” than that debt rule, the inconsistency problem is best tackled with reference to the deficit rule.

Two changes could be considered, characterised by different degrees of complexity and by different impacts on the existing fiscal framework.<sup>74</sup>

The simpler change would be to refer to cash accounts when compiling the deficit measure presently adopted. This would increase transparency and timeliness of data, thereby improving the effectiveness of both the rules and the monitoring process. While cash data are not immune from window-dressing (e.g., by delaying payments to providers or to employees), it is likely that somebody would voice against such practices (the providers of goods and services and the recipients of salaries and social benefits). This is not the case for opportunistic accrual accounting.

The more complex change would be to redefine the reference deficit as the change in nominal debt. This would have further benefits in terms of timeliness and transparency. As to the former, data on financial liabilities are available more rapidly than data on real transactions and on transactions in financial assets (generally the information set for the general government is complete within a

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<sup>73</sup> Concerning the first aspect, the nominal value of liabilities affects the debt while it is the price actually paid by the creditor that corresponds to the deficit. Concerning the second aspect, foreign currency debt is converted in domestic currency values based on end-of-period exchange rates, while the value of the transaction corresponding to the deficit is the one computed on the basis of the exchange rate at the time of the transaction.

<sup>74</sup> See Balassone, Franco and Zotteri (2002).

month after the end of the reference period). As to the latter, data are usually publicly available from market sources.<sup>75</sup>

This change would also imply the use of a comprehensive deficit measure, in line with the focus of sustainability analysis.<sup>76</sup> Moreover, it would increase the consistency of EMU fiscal framework as it would amount to collapsing the two indicators currently used into one. By applying the new deficit definition to both the medium term target of close to balance or in surplus and the 3 per cent threshold, debt dynamics would also be under control.

## 6. Debt management and fiscal rules

The main objective of debt management is usually to minimise the cost of covering government's borrowing needs, given a certain level of acceptable risk.

This objective is complemented by other objectives which can be split into two groups. First, there are those relating directly to the conduct of government borrowing operations such as ensuring the government's continued access to financial markets, ensuring an effective and efficient liability management with regard to costs and risks, achieving a balanced maturity structure and ensuring an effective management of the new issue operation and an efficient functioning of the secondary market for government securities (Tobin, 1963). Second, there are objectives related to other policies such as "coordination" with respect to monetary policy, improving the functioning of financial markets at large, developing the bond market as a whole, promoting household saving and contributing to a better distribution of income and private wealth (OECD, 1993).<sup>77</sup>

Complementary objectives are likely to play a different role from country to country and their role may as well change over time within the same country (indeed, the role played by complementary targets may depend, for example, on the size of public debt; OECD, 1999).

Some recent developments reflect changes in the relative importance of the objectives of debt management. In particular, since the late Nineties in many OECD

<sup>75</sup> Or, at least, they are available not only from government sources but also from the counterparts of the underlying financial transactions.

<sup>76</sup> The change would imply the inclusion in the deficit measure of the difference between the nominal value of bonds and their price at issuance, which is fine within the context of sustainability analysis. On the contrary, the change in nominal debt ought to be measured net of the effects of exchange rate movements via foreign currency denominated government bonds (which are not under government's control). However, the opportunity and necessity of using this kind of financial instruments may also need to be reassessed.

<sup>77</sup> For example, HM Treasury (1998b) states that "[t]he primary objective of debt management policy is to minimise the long-term cost of meeting the government's financing needs, taking into account risk, while ensuring that debt management policy is consistent with the objectives of monetary policy. The government will meet this objective by: (1) determining the maturity and nature of the government debt portfolio, through managing the maturity and composition of debt issuance; (2) pursuing debt management policies that are open, predictable and transparent; (3) developing a liquid and efficient gilt market; (4) offering retail savings instruments through National Savings which provide cost effective funding.

countries the supply of government bonds has become more concentrated (*i.e.*, government issue large amounts of a small variety of bonds). In the secondary market, debt management has become more active. In both the primary and the secondary markets, improvements depends on the extensive use of electronic tools for issuing and exchanging bonds (Scarpelli, 2002). All these developments can be linked to the target of increasing the liquidity of the government bond market so as to reduce the cost of debt: the more liquid the market is, the lower the premium that investors are likely to require on top of the government bond return.<sup>78</sup>

The introduction of fiscal rules may affect debt management either via a change in the macroeconomic environment or via a change in the priorities of the manager (indeed the cost of non compliance with the rule enters the manager's objective function). Specifically, fiscal rules can affect the choice of the maturity structure and the indexation features. We consider two aspects: the first refer to the short-term potential effects of fiscal rules on debt management, the second regards some possible medium and long-run effects.

#### *Short term issues: smoothing the budget balance and window dressing*

If the debt manager has an objective function which explicitly considers the instability of the budget balance as a cost, the optimal debt composition depends on the correlation between output, inflation and interest rates (Lucas and Stokey, 1983). If output and interest rates are negatively correlated, then a long term debt maturity would limit the effects of unfavourable interest rates shock when the debt would anyway tend to worsen (via the negative effect of the cyclical conditions on the budget balance). Moreover, the budgetary effects of shocks to interest rates decrease with the debt maturity. Thus, the optimal debt maturity lengthens with the volatility of interest payments. Obviously, the importance of all these effects increases with the debt size.

First, the introduction of a fiscal rule changes the terms of references used by the debt management to judge the stability of the budget balance. For instance, in the EMU context, the 3 per cent limit on the deficit to GDP ratio has to be accounted for. The debt manager can use maturity and indexation to hedge against inflation and output shocks to the budget so as to stabilise the deficit to GDP ratio below the 3 per cent threshold (see Giordano, 2001 and Missale, 2003). The impact on debt management is even stronger if the debt manager considered budget stabilisation as irrelevant in determining debt costs before the introduction of the rule.

Moreover, given the overall debt cost (in present value terms) that the manager is willing to bear, a fiscal rule can affect the choice concerning the mix of

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<sup>78</sup> This point is also stressed by FitchRatings (2004) and by the ECB (2003). These developments are particularly visible in EMU countries. Indeed, since all government securities issued by EMU countries are denominated in euro, the liquidity and the risk of these bonds have become their distinguishing features. EMU participation also contributed to an increase in competition among governments in selling their bonds.

present and future costs. Specifically, the increase in current potential costs due to possible non-compliance introduces incentives in favour of financing tools which shift costs from today to tomorrow (e.g., swap operations).

Finally, the introduction of a rule can induce the debt manager to use financing tools which are more costly, but are not classified as public debt. These include securitisation operations and the building up of financial networks ensuring that debt is issued by entities outside the general government rather than by the general government itself.<sup>79</sup>

With reference to the US statutory limits to federal gross indebtedness, Buchanan and Wagner (1967) stress that “in order to avoid the necessity to ask for continuous shifts upwards in the legal limits, government agencies and officials attempt to finance various federal expenditures through ways that do not fall within the nominally measures totals of public debt”.

#### *Long term issues: declining debt ratios*

Fiscal rules generally aim at creating a low-deficit environment. The Stability and Growth Pact specifies that each country should aim for a medium term objective of a budgetary position “close to balance or in surplus”.<sup>80</sup> This would set the debt ratios on a declining trend (if the impact of stock-flow adjustment does not offset that of the budget balance). Asymptotically, debt ratios would converge to zero, to negative ratios or to relatively low levels, depending on the target set and the stock-flow adjustments.

This drives the attention to the policy options available to policy makers in this new environment characterised by low and declining debt.<sup>81</sup> the key challenge would be to minimise the negative side effects of the projected decline in debt. Indeed, as already mentioned, governments’ bonds have an important hedging and pricing role, they guarantee the liquidity of the bond market and make monetary policy signals more transparent.

OECD (1999) suggests two reasons for maintaining a minimum level of gross debt while possibly reducing net debt.<sup>82</sup> First, private debt bonds are not perfect

<sup>79</sup> In recent years some European countries tried to reduce their general government debt-to-GDP ratio by moving some units (and therefore their debt position) from the general government sector to outside this sector.

<sup>80</sup> According to the guidelines of the European Council, compliance with the Stability and Growth Pact should be assessed considering the cyclical position of the economy. Even though not explicitly phrased in these terms, EMU rules may therefore be interpreted as requiring that each member state choose a budgetary target in cyclically adjusted terms and let automatic stabilisers or discretionary action operate symmetrically around it without bringing the nominal deficit above the 3 per cent limit.

<sup>81</sup> Gokhale (2002) considers these issues with reference to the US experience. See also IMF (2001) and Bohn (2002).

<sup>82</sup> This could be done by investing government surpluses in private financial assets. This would drive debt management to face a new problem: how to build up an optimal position in private-sector assets. In particular, investing in private assets raises the issue of dead-weight losses: this type of investment is  
(continues)

substitutes for public debt bonds (see Section 1.2). Second, once gross debt is fully repaid, should public budgets turn unbalanced again, starting up afresh a market for government bonds would entail significant costs. It has also been suggested that governments should introduce new saving vehicles, such as wage-indexed and longevity-indexed bonds, which would allow for sharing across generations the specific risks pertaining to ageing societies, such as those concerning productivity trends, asset valuation and demographic shocks (Bohn, 2002).

## **7. Conclusion**

The implications of public debt have long been debated. The discussion involved different professions and covered a wide range of topics. This paper offers a bird's eye view of the main issues.

We followed a long thread. We moved from the discussion of the good uses to which public debt can be put in principle to the analysis of its possible misuses. We highlighted the costs of such misuses and stressed the importance of debt sustainability analysis and of effective control mechanisms, both market and rule-based. We concluded with the implications of fiscal rules for debt management.

The public finance tradition justifies government deficits in the face of exceptional circumstances, for financing fixed capital formation and when the economy is under unfavourable macroeconomic conditions. Public bonds are also a relevant instrument for the development of financial markets and the conduct of monetary policy. These factors should not normally justify high debts.

Both theory and experience confirm the intuition of the earlier studies concerning the risk that myopic or opportunistic behaviour by policy-makers results in unsustainable debt dynamics. High public debts can induce distortions and reduce growth. They can determine financial crises with disruptive effects. The analysis of debt sustainability is made problematic by the lack of a fully specified theoretical framework and by practical measurement difficulties. Information problems also hamper the effectiveness of discipline inducing mechanisms. While the market alone seems unlikely to provide adequate incentives, a rule based approach, though used in many countries, is not unproblematic. In general, state-contingent rules are preferable but they are not always workable.

Public debt can be defined in different ways, depending on the sector of reference and the liabilities to be considered. Reference to a gross measure seems most appropriate, however net debt and more comprehensive measures of public liabilities can provide important complementary information. The introduction of fiscal rules may increase the incentives for opportunistic behaviour and even produce adverse effects by distorting the priorities of debt management.

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generally inefficient because it is likely to be based on political preferences rather than on market signals and it is likely to create incentives for private firms to lobby for benefiting from public investments. See Gokhale (2002).

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Along our journey through the extremely varied land of debt finance, we did not stop at all sites that would have deserved a visit. Where we stopped, we did not stay for long. Even so, we have highlighted many problems which remain open, in spite of a long debate and an extensive literature. While a few years ago some economists worried about the consequences of a disappearing public debt, public debt remains a major policy issue both in developed and in emerging economies. Public debt will remain with us in the future (and so will the unending debate among economists).

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