THE REDUCTION OF THE ITALIAN PUBLIC DEBT: PROBLEMS AND OPPORTUNITIES

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Abstract: The basic argument of this paper is that respecting Italy's commitment with the European Union to bring the ratio of its public debt to GDP down to 60% within a reasonable number of years, requires an exceptional effort.

We show that if one assumes values for the main variables which reflect either past experience or expected trends, the objective is difficult. Also, we show that the problem of stimulating growth in an healthy and productive manner might be more important than anything else.

We conclude that it is essential to identify paths compatible with both debt reduction and growth.

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1. Introduction

The ratio of Italian public debt to GDP was reduced in 1999 to about 114% and Italy intends to continue to reduce it to 60% within a reasonable number of years, respecting its commitment to the European Union. In this paper we analyse the difficulties in continuing this effort.

The plan of the paper is the following. In section 2 we describe the standard model that explains government debt evolution and in section 3 we review previous literature on the topic. Next we describe the convergence issue: in section 4 we find the limit values of the forcing variables that assure the achievement of the 60% target, while in section 5 we look at the impact of deviations of the forcing variables from those values. In section 6, in order to study the plausibility of continuing the current effort for another decade or so, we look at the difference between those values and the values which have prevailed in Italy and abroad in the last decades; in paragraph 7 we measure the impact of variables which today can be expected to significantly (negatively) affect Italian debt in the future. Finally in section 8 we draw conclusions.

2. The basic model

Government debt evolution can be described by the following equation:

$$B_t - B_{t-1} = G_t - T_t + iB_{t-1}$$

where

B_t represents the stock of bond debt, G_t is public expenditure net of interest payments, T_t are fiscal revenues and i is nominal interest rate.

By dividing all the variables in that equation by nominal GDP, one obtains the following equation (differential of the first order; but one at the differences would be of the same use) which describes the pattern of the debt evolution:

$$\frac{db}{dt} = b_{t-1}(i-g) - a$$

where

b is the ratio of debt to GDP; db/dt is the rate of change of b; g is the growth rate of nominal GDP; i is the nominal average interest paid on the stock of debt; a is the ratio between primary surplus and GDP.

Formally the solution of that equation is equal to:

$$b(t) = A \cdot e^{(i-g)t} - \frac{a}{g-i}$$

where A is an arbitrary constant coming from some initial condition like

$$A = b(0) + \frac{a}{g-i}$$

and where the particular integral

$$- \frac{a}{g-i}$$

is the hypothetical long-term equilibrium, while the associated integral

$$A \cdot e^{(i-g)t}$$

is the temporary deviation from equilibrium.

In considering the analytical solution, the decomposition between long term equilibrium and temporary deviation should be read carefully. This is because here the economic problem is the special one of reducing debt starting from an abnormally high value, rather than the one of finding a long term economic equilibrium. During this special period, a trajectory along a diverging, downward path, is necessary. Only at the end of this special period necessary to achieve the goal of the 60% value for that ratio, could one pursue stability at that level and therefore a long-term equilibrium.

3. Results of previous studies

Since the beginning of the convergence effort, various economists, *e.g.* Sylos Labini [1997], Arcelli [1998], Canullo and Pettenati [1998], have verified the soundness of the Italian governments' attempts; they have concluded that even under more pessimistic scenarios than the one supposed by the Italian governments, Italy could converge at the 60% ratio within a reasonable number of years, as it did after the unification of the country during the period 1897-1913 and after the world wars. In Table 1 below we review the values assumed in those studies for the input variables and the resulting number of years necessary to converge at 60%.

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We have not reported all the cases considered by each author, but in general they have modified the official forecasts (pessimistically). The conclusion of all those analyses, with the exception of Arcelli's worst case, has been that the objective can be achieved even under those more pessimistic scenarios.

Arcelli has also considered the possible beneficial effect of privatisation and of GDP revaluation in order to take into account unofficial (non-taxed) economy. The effect of these measures depends upon the hypothetical values of the other variables, but it can be assumed that under a 10% GDP revaluation, taking into account the black economy, the debt to GDP ratio would converge at 60% four years in advance, while privatisation would have a low impact on these calculations.

4. A syntethic representation of the values compatible with convergence

The equation which describes the evolution of the debt to GDP ratio contains three forcing variables: GDP growth rate, average cost of public debt and primary surplus. Here we start by looking at the combinations of values that allow convergence. Unlike previous studies, which have used

specific values for the initial years, taken from official forecasts, and which have simulated the path by plugging in average expected values for the remaining years, we use stable values and differential equations. The main reasons are both that the analytic approach provides interesting information, and that the previous analysis has already quantified the effects of *una tantum* events, like privatisation, so that repeating the simulations to take such events into account is only of limited interest.

To start with, we work with nominal values and we assume an inflation rate equal to 2.5%. Besides, since the average cost of the Italian debt is almost exogenous for Italy, since joining the Euro zone, then we assume that during the whole period it is equal to 5%; even if it is currently higher, it does not appear that such a hypothesis changes the substance of the issue significantly. Therefore we can concentrate on the level curves that describe the combinations of GDP growth rate and primary surplus that allow reduction to 60% in a given year. This is helpful also when evaluating the sensitivity of the goal in relation to different values of the three input variables. Graph 1 which follows shows those combinations:

Graph 1 more or less here

The graph shows two fundamental facts. The first is that the rate of growth of nominal GDP and the ratio of primary surplus over GDP are almost in a one-to-one relationship in terms of their effect on the year of achieving a given level. For instance, if we want to reduce the ratio to 60% within 12 years, then any sum of the two values which is equal to about 9.6% allows for achieving that goal. The second is that the year in which the goal is achieved tends to become exponentially further away, as the values of those two variables move away from the required ones. This is shown even better in Graph 2 below. For instance, if we move from a value of 9.6% to one of 8.3%, the time period necessary to get to 60% increases by four years. But if we move further from a total of 7.4% to one of 6.6%, then the time necessary increases by 16 years.

INSERIRE Graph 2

5.   Predictable values for primary surplus

Various factors in the primary surplus predicted values are troubling.

First of all, primary surpluses equal to 5% for a prolonged period have not been observed in the experience of OECD countries in the last 20 years, despite the efforts that many countries have had to make. Even Ireland, the most virtuous country from this point of view, has achieved an average primary surplus equal to 3% of GDP. This is shown in Table 2 below which reports primary surpluses in OECD countries between 1981 and 1997 as a percentage of GDP.

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The demographic situation is also disturbing. According to studies from public institutions like the «Ragioneria Generale dello Stato[1]» and public Committees like the «Commissione Onofri», the ratio of dependent population[2] will increase from 26.5% in the year 2000 to 37.5% in 2020, due to an increase in ageing. As a consequence, it has been estimated that health expenditure will grow, as a percentage of GDP, by half a point in the next twenty years and by another point in the following twenty years. Pension expenditure will grow by another 1.5 points during the next twenty years.

Also, on the expenditure side, investments have increased very slowly in Italy during the last decade. As it is well known, for many years the enormous efforts made in order to reduce public deficit have concentrated on the revenues side, while on the expenditure side the component that has been reduced most is investments, which have decreased by more than 2%, from 19.7% of GDP in 1988 to 17.6% in 1997. Meanwhile, in the last ten years gross investments have increased by 40% in the USA, 25% in the 7 main industrialised countries, and only 8% in Italy, as shown in Table 3 below.

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On the basis of all the facts identified above, government expenditure can be reasonably expected to be under pressure in the next decade, we therefore calculate where the system seems to be going spontaneously. We assume an average interest rate equal to 5%, and for the time being we assume that nominal GDP grows at 5.5%. Then, we take into account the two problems identified above: the demographic trends and the need to accelerate investments. We start from a primary surplus equal to 5.5%, which is the average of those of 1997, 1998 and 1999; subtracting from that average 1.5% to take into account demographic tendencies, we calculate that the objective would be achieved (and maintained) in 12 years; also, assuming that investments are boosted by spending another 1%, the objective would only be achieved in 16 years.

Obviously, objections to these hypotheses are possible: for instance, investments might be boosted indirectly without government expenditure; or forecasts of demographic evolution might turn out to be wrong and too pessimistic. In any case, those two factors have to be taken into account because they are well-known and quantified; these forces, and possibly various others, put the primary surplus under serious pressure.

The situation does not appear more encouraging if one simulates Italy's reduction of public debt by assuming that it will repeat the experience of other countries. Table 4 shows that if we assume a primary surplus equal to that of the most virtuous country, Ireland, which had 3%, reduction to 60% would only be achieved in 26 years. Instead, if we assume the Italian past experience of the Giolittian period to be applicable, with a surplus of 4.7%, the 60% ratio would be achieved in 11 years.

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[1] The Italian State Accounting Department
[2] Popolazione aged 65 or more, divided by population aged between 15 and 64

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6. Predictable values for GDP growth

The other fundamental variable in determining the evolution of the debt / GDP ratio is GDP growth rate. Table 5 below shows that in the last ten years, in the main industrialised countries, real GDP has grown at rates lower the one which is necessary to achieve the target.

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We have added to those figures a 2.5% inflation component and we have checked the effect on the convergence target, connected with the analysis of the previous paragraph of different possible values of the primary surplus in absence of proper action. Specifically, we have combined the three hypotheses of the previous paragraph on primary surplus, together with the GDP growth rates of the two limiting cases of the US and of Sweden (the countries growing at, respectively, the fastest and the slowest pace), as well as the average of all those countries. We have considered the average values of the last three decades. The results are shown in Table 6 below.

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The first three lines indicate that if Italy could really maintain a very high primary surplus (and assuming it is independent from GDP growth), then the difference by just 1.2% between the Swedish and the US models would not make any difference because the goal of reducing debt/ GDP to 60% would be achieved within 9 to 11 years anyway.

The situation is different when primary surplus cannot be maintained so high. The middle part of the table shows that with primary surplus at 3.5%, the 60% goal could be achieved in 14 years under the US scenario, while it could only be achieved in 19 years under the Swedish one.

Finally, when primary surplus is at 1.5%, the delay caused by the worse scenario is very significant, as much as 40 years more, although both scenarios would make the reduction to 60% move far away into the future.

7. Pension expenditure and the importance of high growth

In the last two years Italy has intensified its efforts to reduce public deficit and public debt and has succeeded in joining the Euro zone, despite many observers predicting the contrary. Recently, however, both the primary surplus and GDP growth also have turned out to be inferior to the values which had been predicted by governments. For instance, in 1998 primary surplus was equal to 4.9%, against a planned value of 6% and a value which '*a regime*' ought to be equal to 5.5%.

Even if they were inferior to the ones predicted, those values were high enough to support the argument that Italy has no problem pursuing its current path. Indeed, if one simulates the evolution of debt over GDP with the 1998 figures for GDP growth and for primary surplus, together with the cost of serving the debt expected 'a regime', one finds that the ratio would

be reduced to 60% in 12 years. However, those data also reveal the difficulties in achieving planned objectives.

Regarding predictable future negative evolutions, recently almost all the emphasis has been placed on the reform of the pension system, with some implicit or explicit claims that cutting the expenses of the welfare system would solve the issue of the large public debt. Serious warnings against the growth of the pensions' expenditure have come from credible institutions like the national Court of Auditors and the «Ragioneria Generale dello Stato». The «Ragioneria Generale dello Stato» has described the situation as follows: pensions expenditure over GDP was equal to 13.4% in 1995, to 14.2% in 1998, to 14.6% in 1999, will be equal to 15.6% in 2015, to 15.8% in 2031, which is nearly 5 points above the European average, to 13.2% in 2050.

On that basis, and on the basis of the average values for GDP growth from Table 5, we have simulated patterns compatible with those past values and forecasts, assuming that the difference between Italy and Europe has matured since 1981. Assuming values in real terms, the corresponding average growth rates for pensions and for GDP are shown in columns 2 and 3 of Table 7 below.

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We recall that if the pension expenditure grows at rate m and GDP grows at rate n, the ratio pension expenditure over GDP grows at the rate of $(1+m)/(1+n)$ which can be approximated by (m-n). Thus we calculate that, if real GDP grew one percentage point more per year, in the future, *i.e.* at a rate equal to 2.5% rather than 1.5%, and given pension expenditure, then the ratio would be equal to the following lower values, in the future: 13.3% in year 2015, 11.6% in 2031, and 8.4% in 2050.

The moral seems to be that in order to solve this problem Italy needs to find a way of allowing the economy to grow more, obviously without 'drugging' it and stimulating it with non-productive expenses, but by genuinely helping the healthy and productive economy to grow.

How to do that is a not an obvious question. Some simple information on that is found by putting together the data in Table 5 with the shares of government expenditure on GDP in the same countries. The latter is reported in Table 8 below. Also, Table 9 reports calculations on the deviations from the average values.

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They reveal two tendencies. Firstly, the growth rates indicate that in the last twenty years the economies that have grown more are those that have had the smallest shares of government expenditure. Secondly, the changes in the growth rates indicate that the economies which have slowed down their growth more are those that have expanded their public sector more.

8. Conclusions

In this paper we have shown that if one assumes values which reflect past national or international experience and expected trends of social and

economic variables, achieving the convergence objective requires an exceptional effort. Thus we claim that it is essential to clarify what patterns of public finance are compatible with both debt reduction and growth and, if necessary, to enact appropriate reforms.

The aggregated analysis of the previous paragraph cannot help to determine the optimum size of the public sector, something that has not been determined by any economic theory. So far, studies of the effects of government size on growth have not provided conclusive indications, as summarised by Tanzi and Lee [1997]. Yet, some of those studies do not appear impeccable from a methodological point of view; for instance the analysis by Levine and Renelt [1992] has been very influential until its methodology and results were criticised by Sala-i-Martin [1997].

More recently Alesina and Perotti [1997] have concluded that «adjustments that rely primarily on spending cuts … are more permanent and expansionary». Their estimates indicate that in Italy, during the periods when fiscal adjustments were based more on expenditure reductions and less on revenue increases, a decrease of primary surplus by 1.5% (as a share of GDP) led to higher growth by 1%.

If this was confirmed by further research, and if it was clarified which components of expenditure and revenue had the most important effects on growth (and employment), neglecting for the time being distributive considerations, what has to be done to keep public accounts in order and, at the same time, assuring the country a satisfactory level of growth, would be clearer.

Some seem to think that an implicit solution is just that of cutting pensions, because it would correspond to a cut on expenditure. We have tried to clarify that arbitrary cuts might be neither necessary nor sufficient, and that if there is some other way of stimulating the economy, such as relaxing constraints in the labour market, than at least a partial decrease in the share of government expenditure might as well follow spontaneously.

Also, it is well known that few of the structural problems of Italian public finances, as well as few of the problems concerning growth, employment and social equity, have been solved. Even more so, it seems to us that finding a model which faces those various issues and makes them compatible is the key. This issue therefore motivates further analysis.

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Graph 1: *Number of years (T) necessary to reduce the debt to GDP ratio to 60%, under different combinations of primary surplus (a) as % of GDP and nominal GDP growth rate (g), when the cost of the debt = 5%*
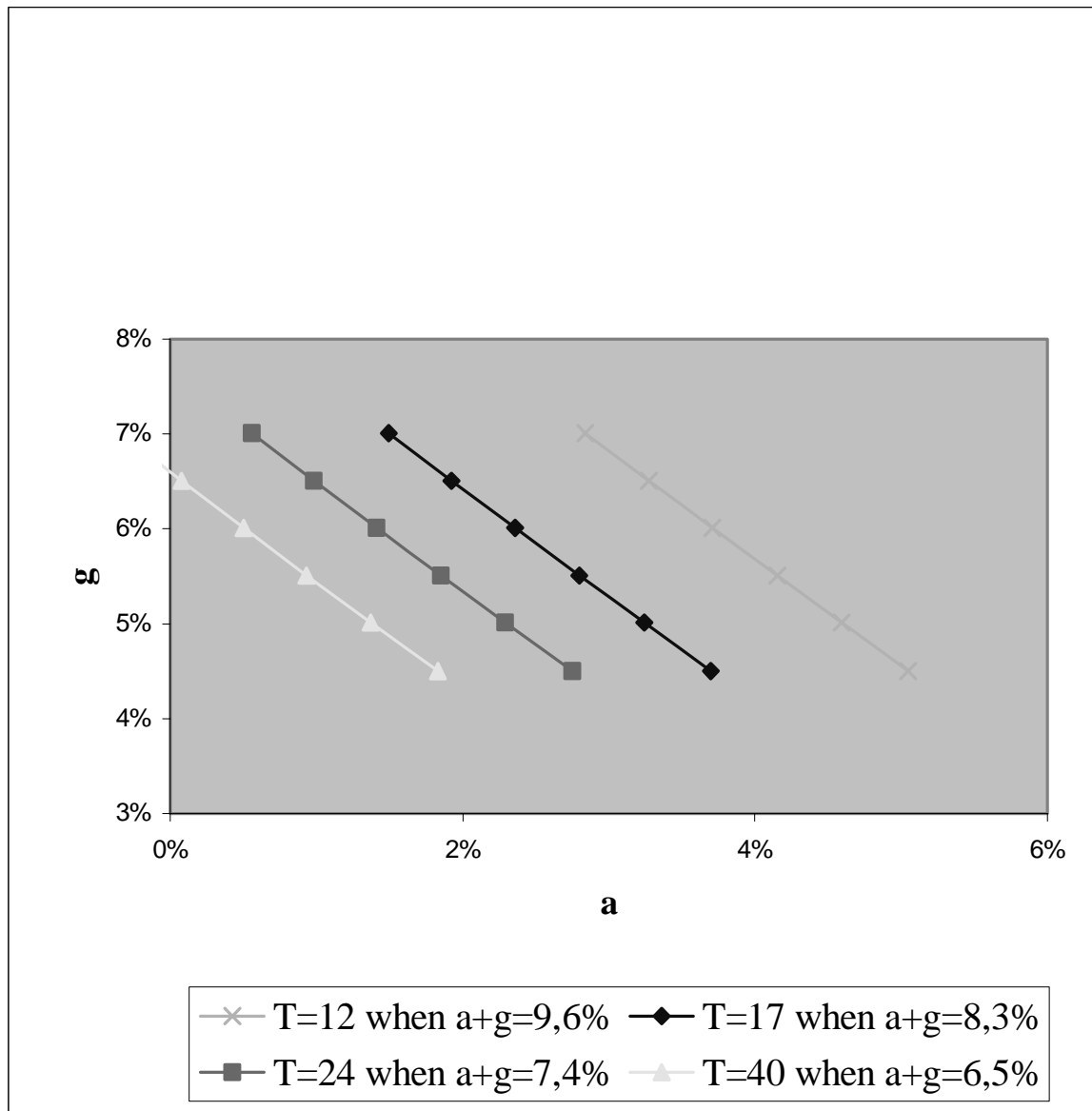
Graph 2: *Number of years necessary to reduce the debt to GDP ratio to 60%, in function of the sum of nominal GDP growth rate and primary surplus as % of GDP, when the cost of the debt = 5%*

N° of years

Sum: nominal GDP growth rate + primary surplus as % of GDP
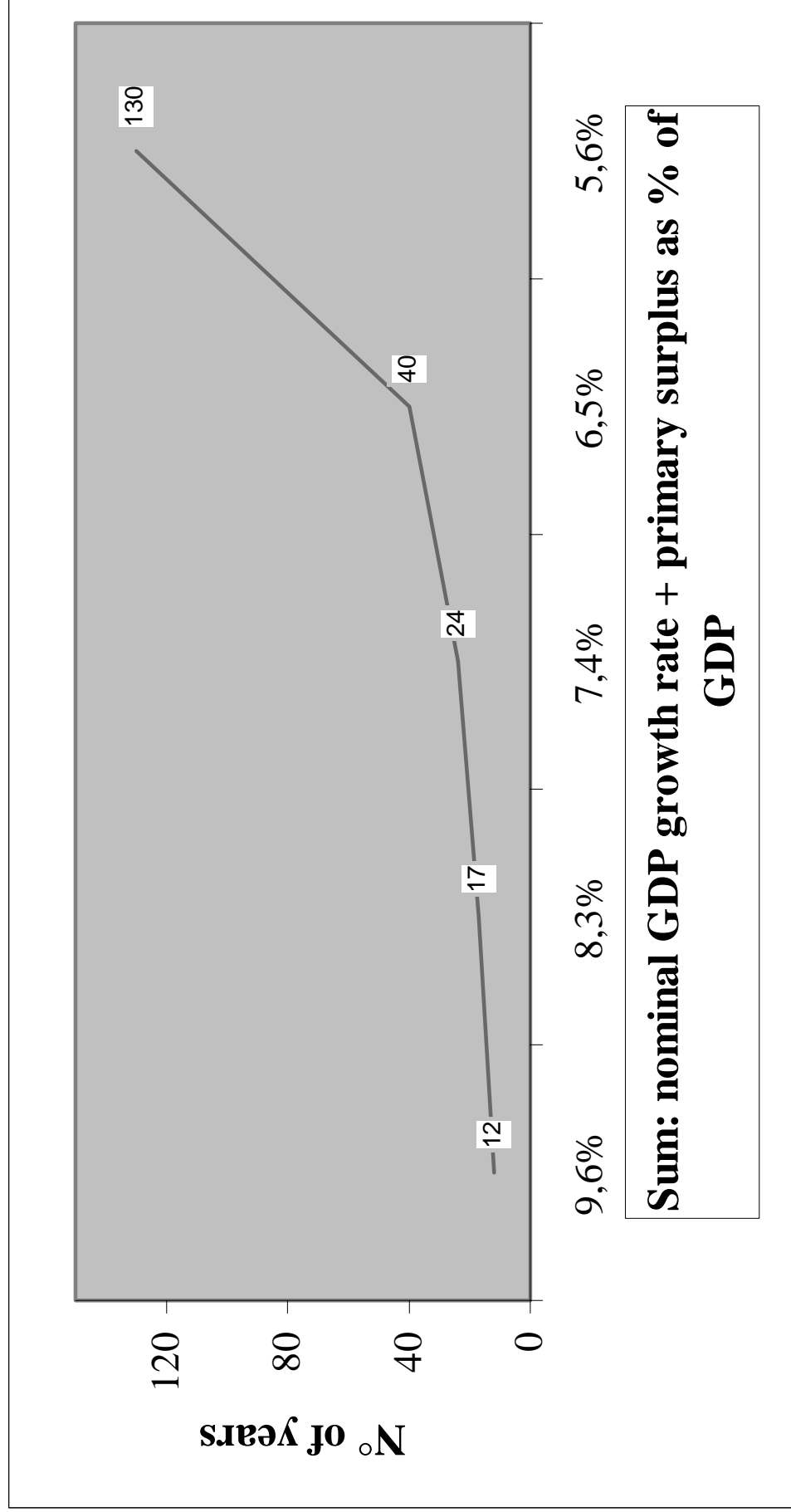
Table 1: *Assumed average values 'a regime' and simulation*
results regarding the n° of years
to reduce the public debt / GDP ratio to 60%
in previous studies

	Average nominal interest cost (%) 1	Nominal GDP growth rate (%) 2	Primary surplus over GDP (%) 3	Sum 2 + 3 (%) 4	N° of years to converge to 60% 5
DPEF 1998	6	4	5,5	9,5	15
Sylos Labini	5	4	5,5	9,5	15
Arcelli worst case	6	3,5	5	8,5	23
Canullo and Pettenati	5,5	4,5	4,7	9,2	18
Interval all cases	5 - 6	3,5 - 4,5	4,7 - 5,5	8,2 - 10	23 – 15

Source: cfr references

Table 2: *General government primary balances (as percentage of GDP)*

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
US	0.4	-1.8	-2.5	-1.1	-1.2	-1.5	-0.6	-0.1	0.3	-0.7	-1.1	-2.3	-1.6	-0.3	0.2	0.9	1.9
Japan	-2.4	-2	-1.8	-0.1	1	0.7	2	2.7	3.6	3.7	3.4	2.1	-0.9	-2.3	-3.1	-3.5	-2.2
Germany	-2.1	-1.3	-0.3	0.4	1.1	1	0.5	0.2	2.3	-0.1	-1.3	-0.3	-0.6	0.3	-0.1	-0.3	0.6
France	-0.7	-1.6	-1.4	-0.9	-0.8	-0.6	0.3	0.5	1	0.8	0.5	-1.1	-2.6	-2.3	-1.4	-0.4	0.4
Italy	-6.6	-5.3	-4.3	-4.7	-5.8	-4.5	-4.4	-3.9	-2.3	-2.9	-1.1	0.7	0.9	0.1	2.4	2.8	5.1
UK	0.7	0.7	-0.2	-0.5	0.5	0.7	1.4	3.3	3.4	1.2	-0.5	-4.2	-5.6	-4.2	-2.6	-1.7	1.2
Canada	0.7	-2.8	-3.9	-3	-3.3	-1.7	0	1.2	1.4	0.7	-2	-2.9	-2.6	-0.5	1.3	3.2	5.6
Sweden	-4.9	-5.4	-3.1	-0.5	-0.8	1	6	4.5	5.9	4.3	-1	-7.5	-11.3	-8.3	-4.3	-0.6	1.9
Ireland	-8.4	-7.8	-5.8	-3.5	-4.2	-4	-1.8	1.9	4.3	3.8	3.2	2.6	2.3	2.7	2	2.7	4.2
Tot OECD	-2	-1.9	-1.8	-0.8	-0.6	-0.3	1.1	1.6	1.8	1.4	0.2	-0.3	-0.9	0	0.8	2.1	2.6
Eur. Union	-2.5	-2.3	-1.9	-1.4	-1.2	-0.8	-0.3	0.3	1.2	0.1	-0.4	-0.8	-1.7	-1.1	-0.3	0.4	2

Source: OECD

Table 3: *Investments average growth rate*
in the main industrialised countries
between 1988 and 1997

	US	Japan	Germany	Canada	UK	France	Italy	Simple average
Average % growth	3,5	3,4	2,6	2,3	1,6	1,3	0,8	2,2
Total for the period	41	39	29	26	18	14	8	25

Source: OECD

Table 4: *N° of years to reduce the debt / GDP ratio to 60%, assuming average cost of debt = 5% nominal GDP growth rate = 5,5% (inflation = 2,5%) on the basis of both Italian and European past experience of <u>primary surpluses</u>*

	Primary surplus as % PIL	N° of years to converge to 60%
I : Primary surplus = average those of 1997 - 1999, minus effects of demographic tendencies for 1.5% (5.5% - 1.5%)	4	12
II : I minus cost boosting investments, equal to 1% (4% - 1%)	3	16
III : Average Ireland primary surplus during 1988-1997	3	26
IV : Italian primary surplus during Giolittian period.	4.7	11

Table 5: *Average annual growth rates of real GDP in some industrialised countries*

	US	Germany	UK	France	Italy	Sweden	Average all
Average 1970-80	3,1	2,7	1,9	3,3	3,6	2,0	2,8
Average 1981-90	2,9	2,3	2,7	2,4	2,3	2,0	2,4
Average 1991-98	2,6	2,1	1,9	1,6	1,2	1,1	1,7

Source: OECD

Table 6: *Year when the debt / GDP ratio arrives to 60%, assuming average cost of debt = 5% and under various scenarios for nominal GDP growth rate (= real GDP growth rate + 2,5%) and primary surplus*

Model for GDP growth	GDP nominal growth (%)	Primary surplus / GDP (%)	N° of years to reduce debt / GDP to 60%
Sweden 1970 - 1997	4,2	5,5	11
Industrialised countries 1970 – 1997	4,8	5,5	10
USA 1970 - 1997	5,4	5,5	9
Sweden 1970 - 1997	4,2	3,5	19
Industrialised countries 1970 – 1997	4,8	3,5	16
USA 1970 - 1997	5,4	3,5	14
Sweden 1970 - 1997	4,2	1,5	69
Industrialised countries 1970 – 1997	4,8	1,5	41
USA 1970 - 1997	5,4	1,5	30

Table 7: *Pension expenditure and GDP growth rates (in real terms) compatible with past patterns and with forecasts from the Italian «Ragioneria Generale dello Stato»*

Period	Pension expenditure growth rate (real terms, %)	GDP growth rate (real terms, %)	Pension expenditure / PIL at the end of the period (%)	Higher GDP growth rate (real terms, %)	Pension expenditure / PIL at the end of the period (%)
1981-1991	3.3	2.3			
1992-1997	3.3	1.2			
1998-1999	3.0	1.2			
2000-2015	1.9	1.5	15.6	2.5	13.3
2016-2031	1.6	1.5	15.8	2.5	11.6
2032-2050	0.5	1.5	13.2	2.5	8.4

Table 8: *Share of government expenditure on GDP in some industrialised countries*

Government expenditure / GDP	US	UK	Germany	France	Italy	Sweden
Average 1981-97	33	42	48	52	52	63
Average 1995 - 97 minus Average 1981 – 83	-0.3	-2.9	0.2	4.3	4.3	0.1

Source: OECD

Table 9: *Real GDP growth and government expenditure in some industrialised countries: deviations from the averages*

	US	UK	Germany	France	Italy	Sweden
Real GDP growth rate : deviations from the average						
1970-80 (mean = 2,8)	0.3	-0.9	-0.1	0.5	0.8	-0.8
1981-90 (mean = 2,4)	0.5	0.3	-0.2	0.0	-0.2	-0.4
1991-98 (mean = 2,7)	0.9	0.1	0.4	-0.1	-0.6	-0.7
Government expenditure : deviations from the average						
1981-97 (mean = 48,3)	-15.3	-6.3	-0.3	3.7	3.7	14.7
Difference between the first and the last three years (mean = 1,0)	-1.3	-3.9	-0.8	3.4	3.4	-0.9

Source: OECD