Greece's Sudden Faltering Economy: From Boom to Bust With special reference to the debt problem

Desli, Evangelia and Pelagidis, Theodore

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Greece's Sudden Faltering Economy: From Boom to Bust

With special reference to the debt problem[1]

Evangelia Desli

Aristotle University of Thessaloniki

and

Theodore Pelagidis

University of Piraeus

Abstract: *In this paper, we deal with theoretical propositions and empirical evidence that are needed to explain the paradox of rapid GDP growth in the face of the dismal competitiveness of the Greek economy during 1995-2008. We show how Greece's economy structural weaknesses have hit the domestic economy and we investigate their impact on the current turmoil of the economy. We show that the previous favourable global economic environment acted as a locomotive to domestic growth, and now that it is gone, structural problems of poor governance, low competitiveness and a ballooning public deficit and debt, have come to the surface. Also, in the context of debt sustainability we look at the recent actions to reduce debt that are taken by the Growth and Stability Program. We construct five scenarios regarding the level of public debt at the end of the 2011-2015 period that is commonly accepted that Greece will return to global financial markets to finance its debt. We find that only under a very optimistic scenario of robust growth of the economy based on structural and institutional reforms that boost productivity, significantly improve competitiveness, and boost the financial sector as described in the Growth and Stability Program along with a successful privatization of 50 billion euros the public debt to gdp ratio can reach the 60% threshold that the financial markets find comfortable. We offer a specific explanation of the current unfortunate state of the economy and we briefly suggest avenues of necessary progressive reforms to overcome it.*

Keywords: *Macroeconomy and Institutions, Competitiveness, The Greek Economy*

JEL Classification: *D020, E020, E300, E660*

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1. **Introduction**

From the mid-1990s until the financial crisis, Greece's economy enjoyed an average growth rate of 4% (*Figure 1*), which let the country converge, more or less, with the eurozone standards of living. But despite that, many structural weaknesses continued to prevail if not deteriorate. Also, during the last 15 years or so, Greece substantially succeeded in improving the 'private standard of living' but it remained behind in the organization of its society, of its economic institutions, of the provision of public goods to the citizens. So, when the global economic crisis hit, all the mess behind the glittering and superficial 'nominal growth' came to the surface and Greece entered a turbulent period with ballooning public debt mainly expressed with the widening of the Greek bond yield spreads relative to the German bonds.

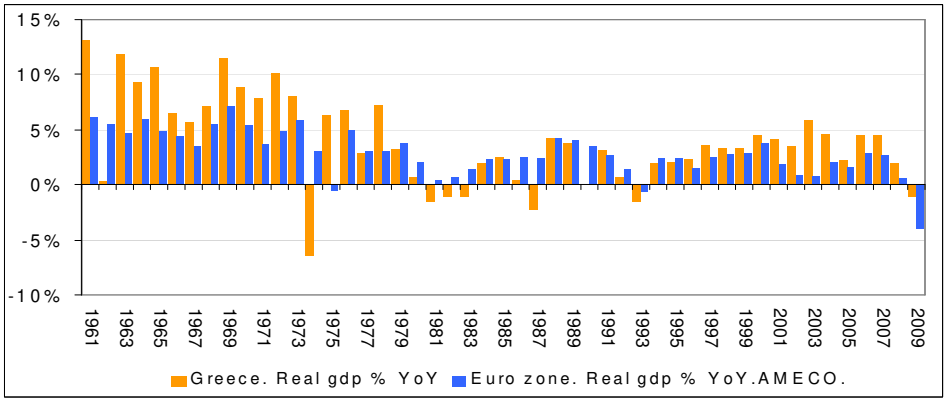
To find a way out of this financial disarray we need first to understand Greece's economy basic flaws, the distortions, the injustices, the bad incentives in her institutions that dominate today this economy and, then, find out the crucial link, the link of cardinal importance, the link that could bring a wave and a domino of progressive structural reforms. In this context, section 2 presents and analyzes the engines of the strong growth and macroeconomic stability that the Greek economy experienced during 1995 to 2008. Section 3 focuses on the warning signs that lied beneath that were mainly facets of low competitiveness, institutional weakness and poor governance and investigate the paradox of the underlying 'high labour productivity' in a low competitiveness context. Section 4 briefly presents the main parameters of the Greek deficit and debt. Section 5 briefly presents the steps taken up-to-date for the dealing of the debt and studies the sustainability of it. Finally, section 6 summarizes and concludes with some policy recommendations.

2. Growth and Macroeconomic Stability. A Historic Evolution of Key Macroeconomic Indicators)

Greece in the 1950s was the poorest country among its EU-15 peers in terms of per-capita GDP but grew to reach the average level by the mid 2000s. During this period it experienced three main phases. *Figure 1* shows the growth rates of Greece and the

Euro zone countries from 1961 and in this section we discuss them along with the engines of growth for the latter period of 1995-2008.

Figure 1 Real GDP growth rate: Eurozone and Greece



Source: OECD, Economic Survey of Greece, Paris 2009, OECD.

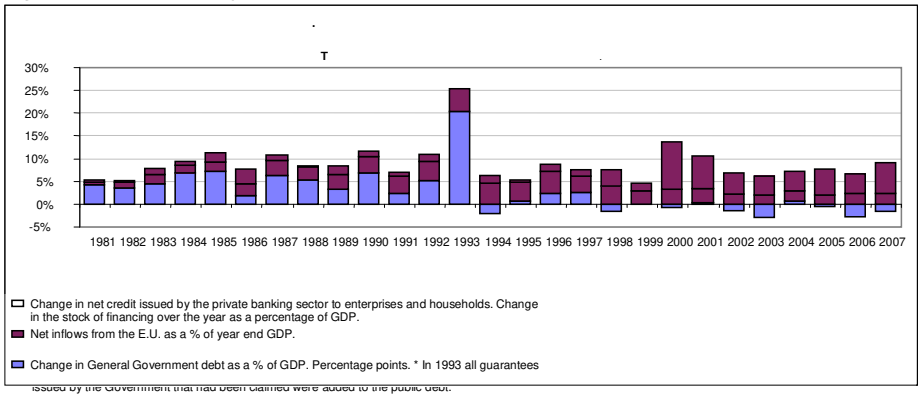
2.1 Strong growth and high productivity 1995-2008

From 1950 to 1973 Greece was the fastest growing economy among the EU-15 (Maddison, 1995). However, during the second half of the 1970s Greece's growth rate decelerated, but it was still the highest among the EU-15, and the second highest (to Japan) growth rate among the OECD countries. This long period of robust growth came to an abrupt end in the early 1980s with not only slower growth rates but frequently negative rates as well. At the beginning of the 1980s two main events occurred, Greece's accession to EEC, which forced changes to the Greek industries that operated into a heavily protected environment and the new socialist party government that adopted a series of increased spending policies (mainly wages and social benefits). The entire decade of the 1980s and the first half of 1990s are characterised by weak per-capita GDP but it was followed by strong growth performance up to 2008. Greece clearly outperformed, after 1995-96, the benchmark euro zone economy. At the same time the employment ratio remained stable for reasons that are presented later and the resulting growth of labour productivity was one of the highest in the EU-15. However, it is absolutely crucial to look at the factors of 'growth' to see why, at least in the great part, this was superficial, fragile, not based on the improvement, the deepening or the expansion of domestic production.

2.2 Engines of growth 1995-2008

The liberalization of the credit markets at the beginning of the 1990s, completed by the end of the 1990s was coupled with entry into the European Monetary Union. These two developments lead simultaneously to macroeconomic stabilization and a steady increase of private credit after 2000. It has also to be stressed that the expansion of private credit replaced after the beginning of the 1990s the government deficit spending as the main way to finance the expansion of consumption in Greece, although the data should be treated with caution.

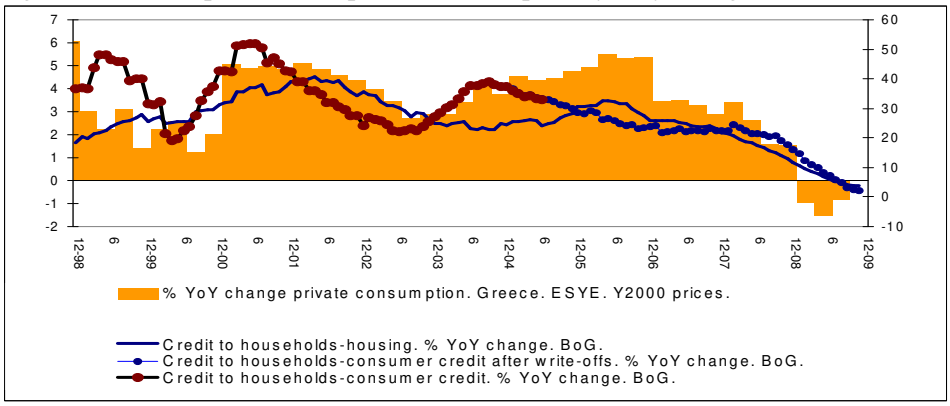
Figure 2. Demand injections



Source: Authors' elaboration from Bank of Greece, Ministry of Finance, European Commission Budget and EUROSTAT, various years.

As *figure 2* shows by measuring demand injections into GDP, the impact of these injections was important as a percentage of GDP for every year during a prolonged period that spans all the duration of Greece's strong performance. The contribution of the stabilization of the macroeconomic outlook of Greece in the wake of EMU accession towards the expansion of private credit was significant, which reflect also the decline in the rates offered by commercial banks to households and businesses. (It also brought a significant fall of the inflation differential of Greece with respect to the eurozone average during the same period). It can be seen clearly how the expansion of credit to households fuelled the growth of private consumption during the past years (*Figure 3*). In fact, only just the period preceding the completion of the infrastructure projects, which were prepared to be ready for the 2004 Olympic Games, private consumption kept accelerating in spite of a lull in the explosive growth of private sector credit.

Figure 3 Credit expansion and private consumption, yearly change, Greece



Source: Authors' elaboration, Bank of Greece, various issues [WHICH PUBLICATION IS THIS]

But this exception is easily explained by the peak in the investment growth rate during that time. Besides the credit expansion, two other factors contributed significantly to Greece's growth performance during the 2000s. Firstly, the shipping and tourism industry. These secure significant annual revenue inflows of about 25% of GDP that are added to the domestic demand and help to mitigate the huge trade balance deficit. Secondly, the fiscal stimulus given by the 2004 Olympic Games nourished through public borrowing and that led to the improvement of certain key infrastructure facilities.

The rapid increase of new investment, both public and private, also demonstrates the impact of the infrastructure investment that was largely financed by the EU structural funds. Still, the rush into EU-financed infrastructure investment did not only contribute to investments and consequently to the creation of new jobs, as in the end many of these projects, when finished, actively boosted to some extent the productivity in the area surrounding Athens. The inflow of funds from the European Union, within the context of the European Union structural funds and the Common Agricultural Policy, also contributed largely to the improvement of key productivity enhancing infrastructure facilities. Last but not least, the improvement in the regulation of certain product markets, which has been reduced from a very high level, even though it still remains very high compared to other OECD countries according to Conway and Nicoletti (2006), contributed significantly to Greece's growth performance during the 2000s. This improvement was mainly due to the liberalization of the telecommunications market at the beginning of the 1990s and to a lesser extent to the liberalization of the transportation and energy sectors.

2.3 Consistently low efficiency

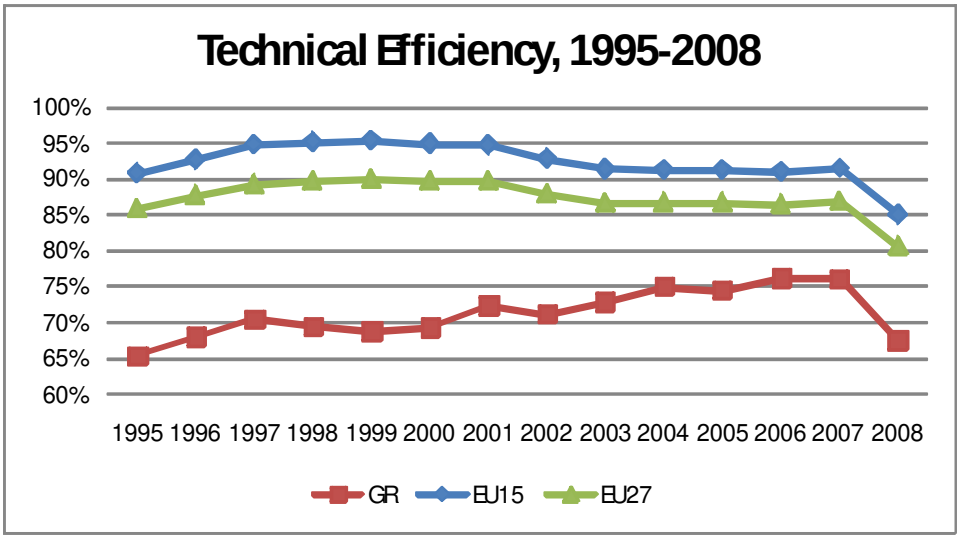
Despite the high growth rate that Greece experienced, the efficiency studies consistently ranked the country among the lowest countries in terms of efficiency among the OECD or EU countries with its efficiency level in the 1980s and 1990s to be around 65-70% at country level (Arestis et al, 2006; Moomaw and Adkins, 2000; Henderson and Zelenyuk, 2007); and even at specific sectors like education at best 70-75% (Afonso and Aubyn, 2005), or public sector around 78% (Afonso, Schuknecht and Tanzi, 2005). Country efficiency is a measure that compares the actual gross domestic output of a country to its potential, where the potential gross domestic output is estimated based on the best practice of its peers using the same type of inputs in their productive process; the sector specific efficiency shows a similar trend. When one observes such low efficiency in one of the largest sectors of the economy like the public sector or in one of the core sectors to future growth like education, there are implications that the entire country suffers from endogenous and persistent shortcomings that spread to all parts of its economy. This may show as a result that the public sector is less inefficient than the public sector but the reality is that the high inefficiency of public sectors such as transportation, education, electricity, etc., doom private sector's efficiency and make it appear worse. Based on most recent data from Eurostat the analysis by Desli and Chatzigiannis (2011) estimated the efficiency of EU-27 countries over the period 1995-2008 and the average efficiency for Greece is 71% versus 87% for the entire EU. The low level of efficiency becomes even more apparent when it is compared to the average efficiency level of 92% displayed by the oldest EU15 members that include the EMU members and should be considered as the peers for Greece. *Table 1* shows these statistics with Greece experiencing the lowest efficiency for this period in 1965 with an efficiency level of 65% and steadily increasing up to 2007 reaching a maximum of 76%. The low standard error during 1995-2008 indicates the efficiency level was stable and further supports that the efficiency of Greece was consistently low and hints that the persistent presence of weaknesses driving the poor performance.

Table 1. Technical Efficiency at Country Level, 1995-2008

Country	Average T.E.	s.e.	Min	Max
EU27	87%	5.7%	18%	100%
EU15	92%	5.4%	48%	100 %
EU new members	43%	8.1%	18%	100%
Greece	71%	3.3%	65%	76%

Source: Authors' elaboration based on efficiency data from Desli and Chatzigiannis (2011).

Figure 4. Technical Efficiency, 1995-2008



Source: Authors' elaboration based on efficiency data from Desli and Chatzigiannis (2011)

Figure 4 shows the annual efficiency levels over time and it can be seen that in the late 1990s Greece's efficiency level was around 70%. It is worth noting that in the 2000s the efficiency level of Greece continued to increase whilst the EU-15 and EU-27 average efficiency levels were declining. This improvement must be due to the same factors discussed in the previous section, which improved the GDP. However, the underlying weakness of this growth is hinted by the sharp reduction of the efficiency level of the Greek economy by 9% versus only 6% of the EU15 members at the beginning of the financial crisis in 2008. From the more detailed presentation of the efficiency levels of selected EU-15 member countries in *Table 2*, it can be seen that countries that seem to have financial troubles lately had severe deterioration of their efficiency levels after the EMU accession, whilst certain countries like Germany

displayed a robustness to the handling of the financial crisis. Portugal seems to fare worse than Greece during the entire period 1995-2008, Spain experienced a deterioration of its efficiency from 89% in 1997 to 60% in 2008 and a similar but not as severe corrosion is observed for Italy and Ireland with their efficiency levels for 2008 to fare slightly above 70%. Overall the average efficiency of the EU-15 area prior to EMU accession was slightly improved but afterwards it was stabilized at a level of 91%. Based on the efficiency studies there might be other countries too among the EU-15 with efficiency levels consistently lower than the EU-15 average that their economies ought to have a closer examination, like Finland.

Table 2 Efficiency level for selected EU-15 member countries (1995-2008)

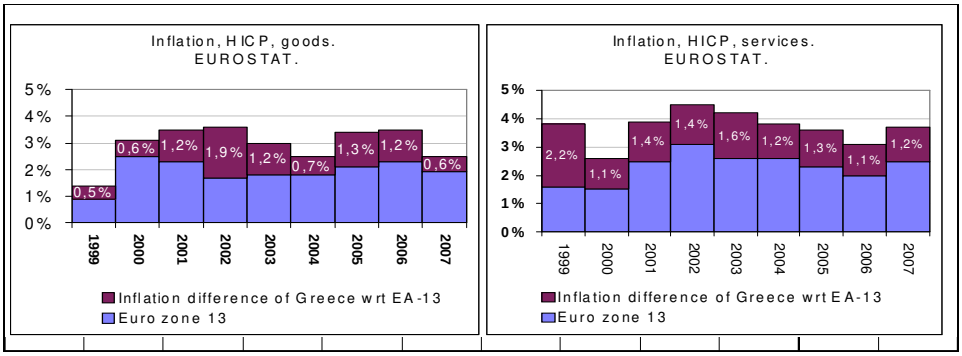
Countries	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
EU-15	91%	93%	95%	95%	95%	95%	95%	93%	91%	91%	91%	91 %	91%	85 %
DE	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
ES	81%	86%	89%	88%	86%	82%	80%	78%	73%	71%	68%	67%	68%	60%
FI	72%	75%	79%	84%	84%	83%	81%	79%	79%	84%	82%	83%	84%	72%
GR	65%	68%	70%	69%	69%	69%	72%	71%	73%	75%	74%	76%	76%	67%
IE	100%	100%	100%	100%	96%	91%	88%	79%	79%	77%	77%	75%	78%	71%
IT	100%	100%	100%	100%	100%	100%	100%	92%	88%	85%	84%	83%	85%	73%
PT	50%	52%	54%	54%	55%	53%	53%	50%	51%	51%	53%	54%	56%	48%

Source: Authors' elaboration based on efficiency data from Desli and Chatzigiannis (2011)

2.4 Warning signs in the real economy during the last decade: Low competitiveness

A wide range of factors persisted in contributing towards the poor performance in certain aspects of the Greek economy. The poor performance regarding competitiveness, to name just the most important one, is not only documented by numerous databases and surveys by international organizations and researchers, but also by the persistent deficit of the current account in double-digit numbers (as a % of GDP). Also, the persisting positive differential with the eurozone average inflation and the unattractiveness of Greece to foreign direct investments that are practically zero (inflows minus outflows).

Figure 5. Inflation Differential between Greece and Euro zone - 13



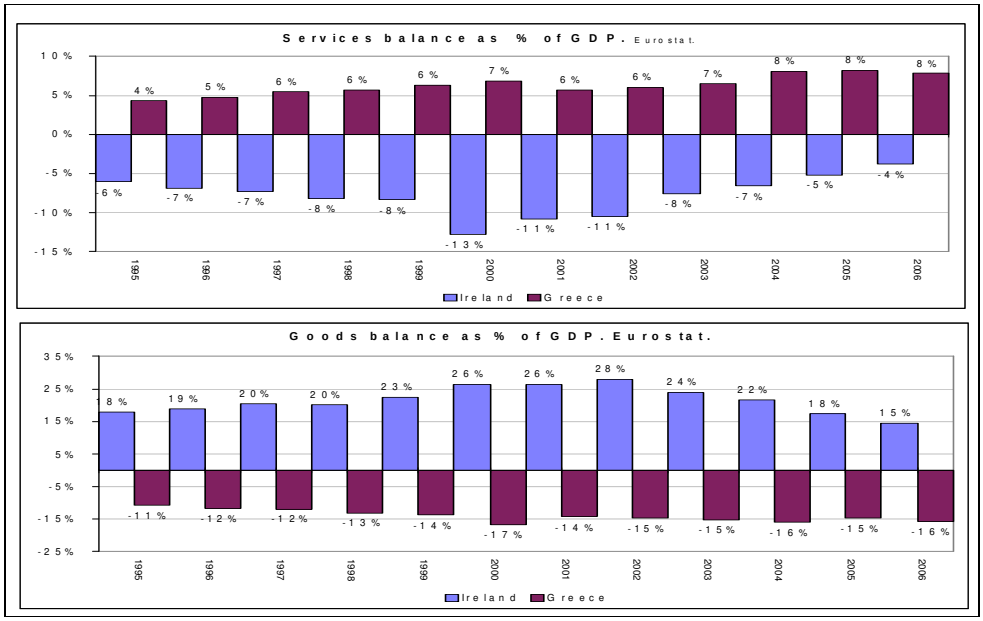
Source: Authors' elaboration, Eurostat data base, various issues

The interesting part about the inflation differential of Greece with the Euro zone (*Figure 5*) is not that it is there, something that many would explain with the Balassa-Samuelson effect because of the rapid growth rate of the country. It is rather that it seems to emerge both in the goods (tradable sector) and services (non-tradable) sub-indexes, something that initially seems to refute the Balassa-Samuelson line of argument.[2] An expository comparison with Ireland, where the inflation rate of the price of goods is much lower than the inflation rate of services and that thus emerges as a textbook Balassa-Samuelson case, is most revealing. The high inflation of Greece therefore seems to emerge as a result more of the demand increase, which is largely driven by the expansion of credit and the inflows from the EU-structural funds as well as from tourism and shipping industry or public borrowing, which is not matched by a similar increase in the domestic supply of goods and services. And this is unlike the case of Ireland in which the surplus of the goods balance seems to finance a deficit in the services balance following again a pattern that fits well the standard predictions of the Balassa-Samuelson model.

The second piece of evidence that supports this argument is the increasing deficit of the goods trade balance, as a percentage of GDP (*Figure 6*)

[2] Although to a certain extent, tourism that constitutes a significant part of services should be considered also as a 'tradable service'.

Figure 6 Goods and Services Balances



Source: Authors' elaboration, Eurostat data base, various issues

As a matter of fact the trade deficit is of a magnitude relative to GDP that has never been seen in any country without the subsequent emergence of serious consequences. In the case of Greece, participation to the eurozone seems to have averted developments like the entrance into a spiral of high inflation and currency devaluations. As a result, the trade deficit in Greece can clearly demonstrate the existence of a serious discrepancy between the growth of domestic demand and the increase of the domestic supply of both goods and services. It should be stressed that in the case of non-tradable services, the inflation differential is sufficient to document the discrepancy between supply and demand, but the emergence of such a differential for goods as well suggests the peculiarity of the case of Greece. Therefore, the evidence at hand would make it more appropriate to label Greece as a unique case of 'quasi Balassa-Samuelson', where exports are replaced by EU-transfers and domestic credit expansion through external public and private borrowing, and the price level is pushed upwards both in the goods and in the services sector, which would actually be in line with the conclusions of recent research on the topic (Gibson 2007; Pelagidis and Toay, 2007). The increase of the goods deficit follows as a natural consequence in this case, as increases in demand are satisfied by competitive and available imported goods as there is no sufficient domestic supply of goods that can compete with the imports.

The third piece of evidence is the following. This persistent deterioration of the goods balance has been financed, besides from the surplus of the services account, through foreign inflows such as loans from foreign banks, in both Greek government bonds as well as into the stocks of Greek companies, at least until the present financial turmoil. However, it should be noted, that rarely were these inflows FDIs. FDIs during the last three years were close to zero ($0.9 billion for 2006, $-2.5 billion for 2007 and $1.3 billion for 2008 (Bank of Greece, 2009).

FDI inward flows for Greece as a percentage of GDP are very low for almost all years, something that is in line with the link between the attractiveness of the business environment and FDI (as described by authors such as Hajkova et al., 2007). The performance of the goods balance together with the inflation differentials with the eurozone for tradable goods suggests also that the cost of importing and distributing these competitive imported goods is higher compared to the eurozone, as a country, to face the sky-high current account deficit, needed to borrow massively to cover it . Furthermore, it suggests that the imports remain competitive in the domestic market in spite of this high cost of importing and distributing, which seems to be really damning for the competitiveness of the domestic supply of goods.

It has to be noted that for the two sectors that contribute to the services account surplus, namely shipping and tourism, it should be noted that they are less affected by the regulatory environment of the Greek economy. This is so either because they operate almost completely outside the Greek jurisdiction and administrative reality, in the case of shipping, or because they draw their competitive strength largely from the geographical attractiveness and the cultural heritage of Greece, as is the case for tourism.

These pieces of evidence manifest themselves in the compelling case for the low competitiveness of the Greek economy that is documented by a number of surveys of World Bank, Transparency International and World Economic Forum of every single year. The impressive part to note here is that a wide selection of different surveys, including those that measure governance and corruption, rank Greece in a roughly similar way even though they often use different methods that are either based on the evaluation of hard evidence, the responses to questionnaires, or a combination of both.

2.5 Facets and evidence of institutional weakness and poor governance

The OECD Regulation Database, the World Economic Forum competitiveness survey, the World Bank 'Doing Business' and Governance Indicators and European Commission estimates (EC, 2006; EU 2002), to name a few, all find that in Greece the administrative burden is also exceptionally high. Namely, that regulation of markets is excessive, that government intervention limits competition as well as resource allocation and pricing decisions in crucial network industries, that the regulation of professional services and legal services in particular are high as far as entry and price setting is concerned. At the same time, qualitative standards are excessively lax (Paterson et al. 2003; OECD 2007), and that the business environment, as an aggregate, is unattractive.

These findings are complemented by more general statements that indicate weak institutions, poor governance (Kaufmann et al, 2005) and high levels of corruption that seem to follow as a consequence of the high administrative burden and the poor governance (Ackerman, 2006).

The magnitude of the weaknesses documented by these pieces of evidence matches the size of the competitiveness deficit documented for Greece by the inflation differential with the eurozone, the current account deficit and the low level of FDIs. It has to be added that, not surprisingly, Greece is found to be the OECD country which has the most to gain from rectifying these documented deficiencies, like product market regulation (Conway, et al. 2006), in terms of increased productivity. This performance can be labelled 'dismal' not because of its absolute level, but because of the large discrepancy between the performance of the country on all these aspects and the per capita GDP that it has achieved in the past years. In particular, following the strong performance till the 1970s and the strong performance of the past years, per capita GDP is relatively close to the per capita GDP of the other OECD and EU member countries. And while Greece remains among the poorer half of these groups, it still can distance itself clearly from most other countries that do not participate in these two groups of privileged countries. On the other hand all the other performance indicators mentioned above are clearly much weaker than the performance of all other OECD and EU member countries. Here Greece clearly is placed, repeatedly, in the

middle of the sample of all the countries in the world, and not in the top 20% of the countries, as is the case with per capita GDP. Greece, ultimately, emerges as a country with almost first-class per capita GDP but clearly second-class governance, institutions, business environment and corruption.

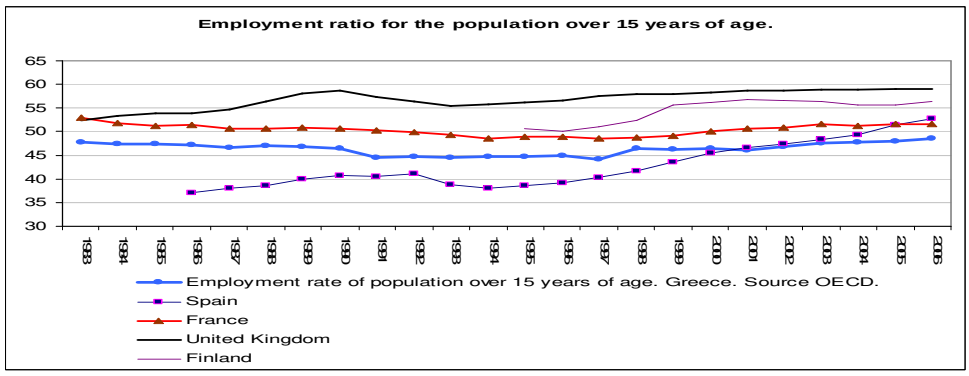
The factors that were analyzed previously and that document why Greece grew so fast in spite of these shortcomings can also reconcile the recent performance of Greece with the now extended literature, mainly of OECD Economic Department Working Papers[3], that directly link the performance of an economy with the quality of the regulatory framework and the prevalence of competitive markets. In a similar way one can reconcile also almost all of the other weak performances of the country, that range from research and innovation (Bassanini et al., 2000) to the protection of the environment, the quality of public health services and schools and the performance of the higher education system (Bassanini and Scarpetta, 2001; Mitsopoulos and Pelagidis, 2007; OECD, 2007b). Even the weak performance of the judiciary can be ultimately linked to this pattern (Mitsopoulos and Pelagidis, 2007; Djankov et al., 2002).

2.6 The paradox of the underlying 'high labour productivity' in a low competitiveness context

The result of the strong demand growth that is not driven by an increase in domestic supply that follows from an increase in employment *(Figure 7)*, directly affects the reliability of productivity indexes that measure GDP to labour input in various forms, which gives a percentage of around 2.5%-3% for Greece during these years. This follows as the increase in the numerator (GDP) matches a restrained increase in the denominator (*Figure 7*), thus measuring a large increase in the productivity per worker or per hour worked, in spite of the dismal performance of the Greek economy as measured by the rigidity index of relevant product markets (*OECD productivity and regulation international database*).

[3] An indicative selection of related OECD and non-OECD related publications is: OECD (2007a); Conway et al, (2006); Bassanini et al, (2006); Nicoletti et al, (2005); Nicoletti et al, (2006); Conway et al, (2005); Bassanini et al, (2002); Scarpetta et al, (2002); Scarpetta, et al, (2002); Nicoletti et al, (2003); OECD (2003); Alesina et al, (2003); Nicoletti et al, (2001); Conway et al, (2006).

Figure 7. Employment ratio for the population over 15 years of age



Source: Authors' elaboration from Eurostat database, 2011

It follows from the previous exposition that the use of such indicators is not correctly capturing the variety of the parameters that shape the performance of the Greek economy during the past decade, often depicting Greece in a position that does not favour the drawing of reliable conclusions. This gives also an explanation to the puzzle of having on the one side high GDP and productivity growth rates, and on the other side low competitiveness with twin deficits.

All kind of structural institutional rigidities that one can easily find in the OECD database constitute a true cost to society in the environment of a non-competitive economy like the Greek economy. It means and leads to the exclusion of many others from the labour market, and especially the young that seek salaried labour. Under 26 years old unemployment is more than 35% and 20% for women and men correspondingly today. This should be read as underutilization of a dynamic labour force, and should not be considered solely as a major social or ethical issue. Also, one should be right to suppose that the riots of December 2008 had their roots on the marginalization of huge masses of unemployed young people.

3. The Greek Public Finances-Debt. A Brief History

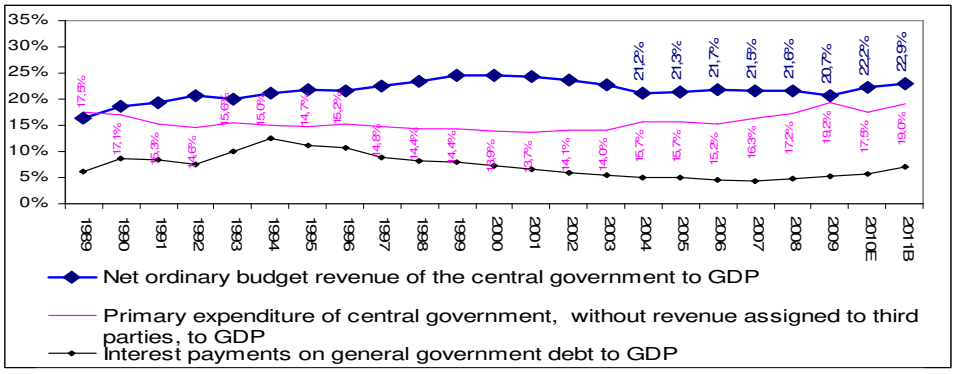
The main index that is used regarding the debt sustainability is the debt-to-GDP ratio. Debt-to-GDP ratio did not increase due to high GDP growth but alarmingly did not

experience a decline. As long as GDP experienced a strong growth the denominator in the ratio would keep the various components into a 'stable' mode. Alongside this a low interest rate environment was enjoyed as being part of the Euro zone. Thus, it was perceived that the debt was under control. However, this was deceiving as after 2003 the government expenses were rising and at the end of 2009 the projected budget deficit was 12.7% vs. expected 5.1% of GDP (in the Annual Budget of 2009) leading in May 2010 to the €110 billion bailout package offered by the EU, the ECB, and the IMF ('troika').

3.1 Main parameters of the Greek Public finances

We can observe in Figure 8 how the primary expenses of the central government were reduced in the 1990-1992 period, and after a significant increase in 1993, that was related to the change of government following the elections at the end of the year (1993), essentially kept under control, as a percentage of GDP, till 2003.

Figure 8. Net revenue, primary expenditure and interest expenditure of Greek central government budget**.**



Source: Annual government budgets, various years. E: estimate, B: budget, including stability and Growth Program update of budget with measures taken up to March 2011.

After 2003 the ratio of expenses to GDP that was kept under control all these years with the help of the rapid growth of GDP during all this period, started to increase as the new government that won the 2004 elections did not fulfill its promise of fiscal responsibility. In the year 2009, when GDP growth had started to falter for the first time since the mid 1990s, the ratio of central government expenditure to GDP increased rapidly (*Figure 8*)**.** This happened as a combination of expenditures like an increase in salaries that reflected the lack of restraint in government hiring the previous years, increasing needs of the social security funds for unbudgeted cash

infusions and increases in the former public sector employee's pension bill. The problem of runaway expenditures, which already was of a sizeable proportion, was further aggravated by the decision of the newly elected government to proceed in the fiscal year 2009 with a 'solidarity' handout and by an initiative to incorporate in the budget of 2009 certain expenditures that were so far either kept off budget; examples are like the procurement of hospitals, or that had not been allocated to a certain fiscal year, like the settlement with former Olympic airways employees. These developments on the expenditure side were paired with the petering out of the falling trend of the interest payment to GDP ratio that, starting in 1994, constantly contributed positively to the improvement of the general government budget bottom-line. To make matters worse, the increasing trend in the central government revenue to GDP ratio that started from 1990 and were kept on an upward trend till 2000, with the significant assistance towards the end of this period of the operation of the tax authorities integrated information system (TAXIS, was gradually reversed. In the 2004-2008 period the situation was stabilized at a lower level, but a renewed reduction in 2009 coincided with the above mentioned developments and resulted in the rapid deterioration of the budgetary net position in that year. Those developments demonstrate that the estimated deterioration for 2009 was built on the foundation of a period during with the structure of the budget was gradually weakened, as the structural gains and efforts of the early 1990s were not followed up.

As a result of the combined effect of the weakening revenue, increasing expenditure and rising interest expenditure, the primary government budget surplus available to finance interest expenses, followed a deteriorating trend, and in 2009 even turned negative. In 2009 the then government shifted many tax returns from the end of 2008 to January 2009 in order to window-dress the 2008 budget, and then in December 2009 the successive government paid out many tax rebates to window-dress the 2010 budget. *(Table 3)*.

Table 3. Macroeconomic Indicators, Millions of Euros

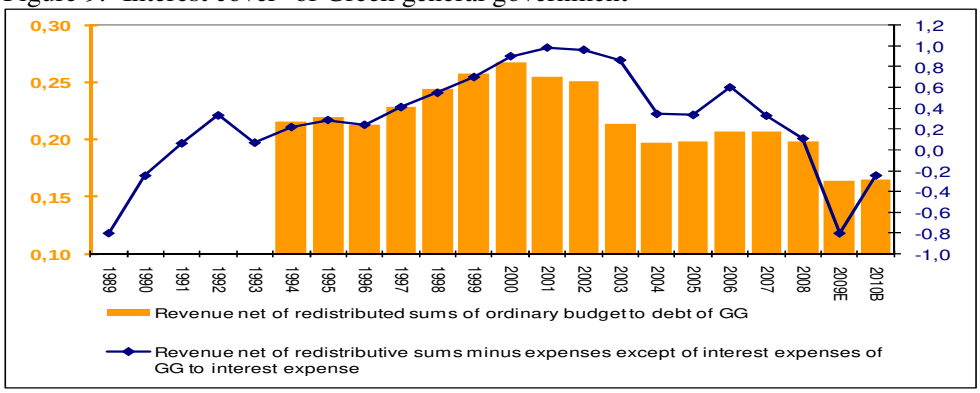
YEAR	GDP*	REVENUES	EXPENDITURES	DEFICIT	DEBT**	DEBT % GDP
2003	153.045	37.500	40.735	-3.235	179.008	117.,0
2004	164.421	40.700	45.414	-4.714	198.832	120.9
2005	196.609	42.206	48.685	-6.479	209.723	118.9

2006	213.085	46.293	50.116	-3.823	224.162	105.1
2007	228.180	49.153	55.733	-6.580	237.742	104.2
2008	239.141	51.680	61.642	-9.962	260.439	108.9
2009	237.494	48.491	71.810	-30.866	298.524	125.7
2010	231.000	52.700	66.188	-19.473	340.680	147.5

Source: Ministry of Finance, Annual Government Budget 2010 (p. 49 and p. 64)
Note: *GDP 2005 upward revised 20% by adding part of the Black economy
** Central Government Debt

The extremely high 'spreads' between the interest of the German and the Greek 10-year bonds documents the reflection of the concerns of financial markets regarding the Greek government bonds, and the ability of Greece to finance its public debt, through the rise in the yield of the benchmark Greek government 10 year bond. The period after the year 2000, which was a period of stable and rapid growth, was not taken advantage of, in any way with regard to the strengthening of the structural position of the budget, and only the falling interest expense, as a percentage of GDP, kept contributing towards the improvement of public finances. *Figure 9* presents this reality from another point of view. The ratio of the central government budget revenue, net of funds collected by the budget on the behalf of other beneficiaries and the redistribution of these funds, to the stock of government debt, that was increasing till 2000, started to decline, At the same time the 'interest cover' of the government, that is the budget surplus available to finance interest expenses, followed a similar trend, assisted though by the fall of the interest expenses, and in 2009 even turned negative. *Figure 8* also shows the projections of the 2011 budget regarding the evolution of revenue and primary expenditure of the central government, as well as the measures announced after the presentation of the 2010 budget as they had cumulated till March 2010 (2010M). If one assumes the GDP used in the 2010 budget and that all other revenue and expenditure items remain as foreseen in the budget, the impact as a percentage of GDP of these measures amounts to roughly 3% of GDP. *Figure 9* thus also documents the source of the concerns of financial markets regarding the Greek government bonds, and also the ability of Greece to finance its public debt. These concerns are further substantiated by certain uncertainties that prevail over the final parameters of the budget for the year 2010 that will in turn affect the realities of the budgets after 2010.

Figure 9. 'Interest cover' of Greek general government



Source: Annual Government Budgets, various years. [reference needed]

One concerns the budgeted cost of borrowing, which according to the 2010 budget, is declining as a percentage of the year's average, existing stock of debt; while so far the yield of the government ten-year bonds remains at levels that significantly exceed , the average yield of 2009 and 2008. As a result the question remains open of whether, gradually, the debt that has been rolled over in 2010 implies an increase in the cost of borrowing for 2011 and the future years till the debt issued in 2011 matures. While the 25 billion, less than 10% of the outstanding debt, that will be rolled over till the summer of 2010 may not crucially affect the average cost of servicing the total debt. The related challenge will become more pertinent during the following two years, when according to the government budget for 2010 nearly half of the outstanding general government debt will have been rolled over.

A second concern is the gradual increase in the expenditure from the central government budget to finance the social security system. During the past years the pensions for the former public employees along with the contribution of the central government budget to the social security funds has been one of the fast growing expenditure items of the budget. Since the absolute magnitude of these expenditure items is also large, amounting to 31.7% of all central government expenditures in 2009, their impact on the net fiscal position of the government budget is one of the most crucial parameters that will determine the net position of the general government budget in the coming years. As a result a reform of the social security system that will reduce these significant and increasingly mounting pressures on the fiscal position of the general government is the other important, and still unresolved, parameter of the fiscal prospects of Greece.

Finally, a third risk remains for the projected fiscal prospects of the country. A deep and prolonged recession in the economy will not only undermine the prospects of the economy in general but government revenues as well. And at the same time the denominator in the debt to GDP ratio will face an unfavourable development in that case. This can threaten the gains of any efforts that will relate to the previously mentioned concerns. The latter risk, which is not insignificant at all, can of course be reduced and possibly even eliminated with the promotion of aggressive product market reforms, as previously outlined, and with an aggressive program to reduce the administrative burden that is today posed on the economy. The importance of this risk is highlighted by the fact that according to the updated Stability and Growth Programme, submitted at the beginning of 2010 by the Greek government, the return of satisfactory growth from last quarters of 2012 will gradually dilute the ratio of general government expenditures to GDP; and this will happen without necessitating their decline in absolute size or even permitting their increase after 2010. At the same time the increase of taxable incomes and profits, along with the growth of GDP, will permit an increase in the revenue of the general government not only as a percentage of GDP but, most significantly, by a sizeable absolute number[4]. The success of this strategy evidently depends crucially on the ability of the economy to return to the projected, in the Stability and Growth Programme, positive growth rates after 2011.

Even though the Greek government announced a new series of measures in March 2010, when added to the measures announced since December 2009, it emerges that most of these measures amount to extraordinary tax increases, which most probably will become permanent once the new tax law is finalized and adopted by the end of September 2011. Only a smaller part of these measures, less than one third[5], comprises expenditure cuts or the freezing of expenditure increases. In addition, these additional measures will probably simply cancel out revenue shortfalls. This could easily happen if the recession of the Greek economy gathers pace until determined efforts to reform the issues analyzed in this chapter are undertaken.

[5] See Greek Stability and Growth Program, projections. January 2010, The Greek Government.

The significance and size of these risks, as well as the potential suggested from the experience of other countries regarding these reforms in combination with the currently adverse ranking of Greece on these aspects, strongly suggests the appropriate way to move, swiftly and decisively, forward. At the same time it has to be stressed that in such a virtuous development it will be much easier to implement a program to reduce the shadow economy and to extract tax revenue from it.

Of course even if these three issues are tackled, with a determined product reform program, a satisfactory reform of the social security system and a continuation of other efforts that will lead to a rapid decline in the cost of borrowing for the Greek government, a number of realities will still prevail in the short term for the Greek public finances. So, it will remain as a reality that the Greek public sector not only has more employees than it needs, and that they are paid on average very generously when compared to private sector salaries. It will remain, above these realities, that the human resources management and the organizational chart of the public sector does not permit its efficient operation and the supply of quality services at low cost to society. Unfortunately this problem has no easy and fast solution. Given that a reduction in the size of public sector employees not only will adversely affect the job market, but also will probably involve the risk of expelling the better working but less well connected, in clientelistic terms, part of the staff. Thereby cuts in the average pay of public sector employees should be preferred over layoffs. The argument for pay cuts, over layoffs, is also substantiated by the high average wage bill per public employee that was revealed by the data presented in Mitsopoulos and Pelagidis (2011). At the same time the better management of wage bills will become possible through the operation of a centralized payment system. This system to be introduced should be able to identify potential cuts in a way that will not hurt too much those who receive relatively low pay and mainly seek out those cases in which numerous handouts and wage related payments lead to very high annual incomes that are not justified by the quality and quantity of the services provided. Tackling the issue of public sector pay is of significant importance, as after the payments for public sector pensioners and social security funds and interests on debt the wage bill is the third big expenditure of the budget amounting to 28.4% of all central government expenditure in 2009, with all other expenditure items such as wage bills, being less significant.

The reform of the social security system and the reduction of the wage bill are pressing priorities since projections to increase taxes are subject to the developments of the economy and the resilience of economic activity, while expenditure cuts will yield the budgeted savings with certainty, regardless of the developments of the economic situation and despite the fact that some reductions in tax revenues should be expected as a result of. As a result the measures implemented since December 2009 and till May 2010, which included increases in consumption taxes on value added, fuels, tobacco, alcohol and so called 'luxury items' as well as a number of extraordinary taxes on profitable corporations, high personal incomes and big estates are all subject to the development of this conjecture. A deepening of the recession will easily evaporate the projected increase of revenue, undermining the effort of fiscal consolidation. On the other hand only 30% of the measures announced in this period refer to cuts in expenditures or the freezing of increases in expenditure. This is unfortunate since, according to Guichard et al. (2007), episodes of fiscal consolidation that are based on government revenue increases are generally less successful and long-lived than the ones that are based on expenditure cuts. The size and historic growth rates of the wage bill and the social security related items that have been mentioned singles these two items out as the preferred targets for such cuts, as has already been described. Such cuts will have also another implication. Today the numerous public sector employees that receive, relatively to the private sector, high pay and produce no value added contribute to the pattern of disproportionally, when compared to other European countries, high consumption as a percentage of GDP that prevails today in Greece. A reduction in the excessive public sector wage and public sector pensions' bill will contribute towards the rationalization of this statistic as well.

3.2 Recent Developments and the memorandum

While starting in January 2010 the government initially attempted to solve the impasse solely through tax increases, it took in March of the same year the step to actually target government expenditure and especially the wage and pension bill of the public sector. The mustering of this 'political courage' can be explained by the fact that at this point, with money markets shut, the Greek government had no

alternative but to demonstrate at least the existence of a will to slash some expenditure. Yet the measures announced by March were later perceived by the markets to be “too little and too late”, and in addition the targeted fiscal correction of these measures still amounted to only a small fraction of the government deficit of well over 25 billion euros. The same can be said of a new tax law that indeed tried to abolish some of the tax exemptions that made so far so many professionals and self employed pay so little personal income tax and that made the everyday circulation of undeclared income so easy. By then financial markets became completely aware of the cobweb of the intervening problems of the uncompetitive Greek economy. And they wanted to see a fiscal consolidation effort commensurate to the deficit as well as a coherent reform strategy. Yet, by April 2010 they had not received that, and they remained firmly shut for the Greek government, leaving the government with only two options: Default or seeking financial assistance. Contemplating the fallout from a default, the government chose to seek financial assistance, by sending in late April 2010 a letter in which it requested the initiation of a process offered by the European Commission, ECB and IMF in anticipation of the unfolding events. This offer required the signing of a Memorandum of Understanding (henceforth: the Memorandum). It was ratified by the Greek parliament with law 3845/2010 of May 6, 2010, and in which the Memorandum of Understanding on Specific Economic Policy Conditionality described the measures the Greek government had to implement in order for the 110 billion loan facility agreement to be activated.

3.3 What the Memorandum initially provided

The Memorandum constitutes a brand-new approach towards the implementation of a reform program in a country whose government seeks financial assistance in an environment of fiscal and macroeconomic pressures that it cannot manage any more by itself. This approach is different from the one adopted by the IMF so far in countries that have sought such assistance. In terms of the latter, once the political agreement was stuck, the euro-zone membership of Greece called for an active involvement of the European Commission and the ECB, together with the representatives of the IMF; the purpose is to draft the conditions set and then supervise the implementation of the commitments made by the Greek government.

This collaboration between the European Commission and the ECB on the one side and the IMF on the other side brought together an unprecedented combination of expertise and capacity to formulate a detailed plan to stabilize the finances of the Greek government and the macroeconomic fundamentals of the Greek economy. A crucial ingredient has been the, increasingly more advanced, benchmarking exercises that are undertaken especially by the European Commission. The coincidence of the know-how at the level of the European Commission to formulate the precise details of the gravest failings of Greece that followed from these benchmarking exercises, as well as the experience accumulated from the 'Lisbon Agenda', allowed the European Commission to pinpoint the exact contours of the conditions that had to be set in the case of Greece before the financial support package could be activated. At the same time the IMF had the necessary experience to oversee and implement such a program. Furthermore, it has tried in the past years to improve the design of the measures that countries that seek its help are asked to implement, in a way that addresses the demonstrated weaknesses of these countries without any prejudice towards the measures that have to be taken. Hence the program designed for Greece did set a useful precedent as on the detailed knowledge of the challenges posed by a country with a political system that demonstrates a consistent and deeply rooted aversion to useful reforms; that was combined with the accumulated expertise of implementing such a custom-made program.

As a result the Memorandum of Understanding on Specific Economic Policy Conditionality provided measures that a) deal with the acute fiscal imbalances of the Greek government; b) try to propose long-term solutions to the underlying reasons that have allowed these imbalances to emerge over many decades, and that relate to the inability of the general government to supervise the use of public funds, control widespread tax fraud and abolish tax exceptions by privileged professional groups; c) try to deal with general government entities, from social security to the public electricity company and public railroads, that have traditionally operated in complete disregard towards the realities of fiscal constraints; d) try to remove the most important of the binding constraints that suppress competition and productivity in product markets; and e) try to introduce some flexibility in a better supervised labour market. In such the Memorandum is wide ranging. In all, it contained, in its original version, over 200 separate actions that were planned to be taken until 2014, either as

small individual actions or as groups of separate actions that in the end aim to secure the successful achievement of the set goals.

3.4 Implementing the Memorandum as of September 2011 and the Medium Term Fiscal Strategy

Regarding the core of the important reforms included in the Memorandum, as social security, opening of crucial network industries and services to competition, as well as the cost cutting side of fiscal consolidation, one can identify during the first year of the implementation of the Memorandum an initial unwillingness of the responsible ministers to fully conform with the spirit of the Memorandum. Subsequent and increasing pressure from the lenders and a tendency to finally, with great delay, present initiatives that seem to conform with the basic guidelines of the Memorandum. Road freight was deregulated, with a 3 year adaptation period, only after repeated oscillations by the responsible ministers and after the exercise of intense pressure from the lenders. An initial effort to deregulate professional services with law 3919/2011 ultimately succumbed, at least partly, to the pressures of the legal profession and, especially, engineering representatives. This is clearly documented by the opinion 11/VI/2011 of the Competition Authority, which was mandated by the Memorandum. Further uncertainties regarding the truthful deregulation of significant for the competitiveness of the economy, job market and government budget professions emerged with the postponement of the deadline for the deregulation of medical professions till the end of 2011, which is to be added to the half-hearted deregulation of the pharmacist's profession, where for example constraints like the mandatory ownership by a licensed pharmacist remain. Regarding the reduction of red-tape, a one-stop shop for company start-ups was created, even though the underlying procedure was not significantly simplified and its effectiveness seems to be questioned by various observers. Furthermore, an action plan to identify 30 obstacles to doing business still had not been implemented by summer 2011, even though working groups supposedly made progress in their drafting. Finally, regarding the energy market the entire main challenges still remained by the summer of 2011. On other fronts though, some behind-the scenes progress was gradually becoming apparent, as for example with the important issue relating licensing and spatial planning, which is especially important to production and manufacturing. By the summer of 2011 key pieces of legislation had been put in place as for example law

3982/2011 that significantly simplifies the process for smaller establishments. By the summer of 2011 the new process for environmental licensing, which is the crucial remaining obstacle for larger establishments, was still work in an, reportedly very advanced, state of progress. Also missing were a couple of secondary decrees, which were expected to be completed within a reasonable amount of time. Drafts for the two last were announced soon after a cabinet reshuffling in early 2011 and were probably marked to be legislated by September – October 2011.

Since product market reforms usually take some time to bear fruit, the insistence to allocate them mostly towards the end of the implementation agenda, as was already manifest in the initial draft of the Memorandum, and then to further procrastinate their truthful and aggressive implementation, evidently risks to expose the economy to a longer, and possibly unnecessary deep, slowdown. The extent of this procrastination may in the end undermine even the fact that markets will price in the anticipated impact of these reforms immediately. The way with which structural reforms that can create a substantial upside to the Greek economy have been promoted, also has created the risk to implement these reforms after a prolonged recession has weakened the domestic financial institutions. This has been so to such an extent that they will be unable to provide a speedy and strong support to initiatives that aim to take advantage of this upside.

On the other hand, regarding especially the Ministry of Finance, there was, as mentioned, an initial reluctance to publicly admit the severity of the situation and a failure to present for over a year the parameters of a coherent and adequate exit strategy. But, finally, the additional measures described in the Medium Term Fiscal Strategy (MTFS), announced in the context of the European Semester by May 2011, seem to have a magnitude that seems proportionate to the problem in hand, regardless of whether one can argue about the policy mix and the details of the corrective measures. Furthermore, press reports and announcements from officials of the Ministry of Finance and the tax authorities indicate at least a truthful effort to end the days of unchecked tax evasion, tax avoidance and tax fraud from private individuals as well as office abuse and corruption from the side of employees. A census of public servants was completed; a census for employees of public companies is planned and the single payment authority for public employees is moving towards completion more than two years after its initial announcement.

Furthermore a number of initiatives included in the Memorandum, some of which were already on the agenda, seem to receive increasing attention and to make firmer progress under the supervision of the lenders. Especially regarding the two laws on social security reform, law 3863/2010 and 3865/2010, their speedy implementation, following the pressure of the lenders to do so, seems to alleviate the forecasts of crippling future fiscal imbalances. These until now burdened significantly the long-term creditworthiness of the Greek government. This significance follows from the fact that pensions for former public employees and contributions to social security funds are, as shown in Figure 10 and together with government wages, among the largest, and fastest growing, single expenditure items. These laws will contribute much to the reestablishment of the creditworthiness of the Greek government as they remove some of the major uncertainties regarding the future ability of the Greek government to honor its obligations. This is so even before the full impact of these laws is felt and before the actuarial studies, which are currently being prepared, are finished and published.

In any case, every measure that the Memorandum and its extention (MIFS) is taken, has a final target to tame the deficit and stabilize it; and, of course, bring down the colossal debt. It is where we turn below, namely dealing with the debt problem.

4. Dealing with the Debt

Presently the most frequently asked question is whether the Greek debt is sustainable or it will need some form of restructuring. In this final section we deal theoretically with the debt issue in Greece and we take a closer look at the evolution of the debt over time which in order to be sustainable needs the annual rate of change of debt to be zero and if possible negative. We use the basic identity of debt dynamics that also defines the main elements of the debt change and we construct five main scenarios to test for debt sustainability.

4.1 Debt Decomposition

The accumulation of the stock of public debt at the end of period *t* depends on the interest payable on the inherited debt from the end of the previous period plus the

budget deficit or surplus during the period *t*. If λ is the debt-to-gdp ratio and $\dot{\lambda}$ is the corresponding rate of change, π is the primary surplus-to-gdp ratio, i is the interest payable on the inherited debt as percentage of GDP, Y is the GDP at current market prices and g the corresponding growth rate, then the rate of change of the stock of public debt is given by (4.1):

$d(\lambda Y)/dt = -\pi Y + iY + fY$.	(4.1)

Where f is the term *stock-flow adjustment* as a percentage of GDP and it includes various activities not reported in the government budget like the accumulation of financial assets as well as changes in the value of debt denominated in foreign currency. Such an activity is the sale of 50 billion worth of assets by the Greek government.[6] Expressing the previous equation as a ratio to GDP we obtain the debt dynamics identity (4.2):

$\dot{\lambda} = -\pi + (i - g) + f$,	(4.2)

which shows the change in the debt-to-gdp ratio in terms of primary deficit ratio ($-\pi$), contribution of interest and nominal growth (i-g) –also called *snowball effect*, and stock flow adjustment ratio (f). A primary surplus would reduce the debt, whilst it is also vital the impact of the snowball effect, i.e. low interest payments and strong economic growth. Following the previously described debt dynamics in equation (4.2) the debt would be stable or reduced if the annual rate of change is zero or negative respectively, i.e. $\dot{\lambda} \leq 0$. In an ideal situation all the three elements of equation (4.2) should be reducing or remain the same. Hence, there should be a primary surplus, which appears to be one of the main targets of the rescue plan for Greece, along with a snowball effect with a negative overall impact and finally if possible considerable stock flow adjustments. Thus, although one of two of the elements of equation (4.2) might be increasing there must be at least one component with a significant reduction

[6] As this paper is written it is expected that this figure will be updated to 28 billion euros in the latest projections in "The Economic Adjustment Programme for Greece - Fourth Review - spring 2011" (European Commission Directorate-General for Economic and Financial Affairs, 2011). As no specific figures exist as of September 2011, we used the initial figure of 50 billion euros in the scenarios for the progress of the public debt over the period 2011-2015.

to overcome any shortcomings. *Figure 10* displays the Greek debt-to-gdp ratio since 1991 and its decomposition to the parts presented in the previous equations.

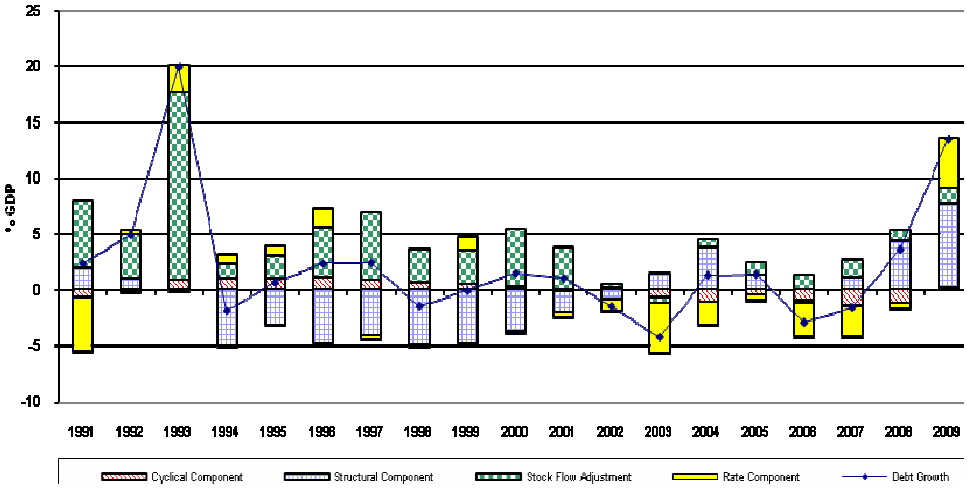
The Greek debt-to-gdp ratio from 71% in 1990 exceeded the 100% threshold in 2000 and it is expected to reach 158% in 2011 and even higher in 2012. As Manessiotis and Reischauer (2001) explain the major increase of a magnitude around 20% that is noted in 1993 is due to the inclusion in the accounting of public debt numerous liabilities in the form of loan guarantees to restructured enterprises through Greek government bonds. Also, the consolidation of government accounts with the central bank, which was a requirement for the second phase of EMU. A number of similar adjustments followed in the period 1994-2001 as EMU requirements and they can be seen by the significant impact of stock flow adjustments. Such adjustments continued but especially so in the fiscal year 2009 when the newly elected government decided to proceed to incorporate in the budget of 2009 certain expenditures that had been either kept off budget, like the procurement of hospitals, or that had not been allocated to a certain fiscal year, like the settlement with former Olympic airways employees.

In anticipation of accession to EMU the strict implementation of a restrained budget resulted to the primary deficit contributing to a reduction of debt accumulation for the period 1994-2002. Furthermore the contribution of primary deficit ratio can be expressed into the components of structural ($-\pi^*$) and cyclical ($-\pi+\pi^*$) contribution. The first component is the debt-to-potential gdp and measures the impact of the debt if the economy was operating at its full capacity. The second component is the result of the economy operating below its full capacity and it reflects the inefficiencies apparent in the economy. As it can be seen during the period 1994-2002, as Greece was improving its efficiency and reducing its output gap, the structural component was contributing significantly to debt reduction, whilst the cyclical component had a minimal impact. However, the trend is reversed after 2003 and the primary deficit amplified the debt especially in 2004. Although one cannot ignore the steep rise on debt financed spending for infrastructure with respect the 2004 Athens Olympic Games, overall it is evident that the Greek government relaxed its control over its budgetary discipline after its entry to EMU. The problem was mainly due to runaway expenditures like an increase in salaries that reflected the lack of restraint in government hiring the previous years, increasing needs of the social security funds for unbudgeted cash infusions and increases in the former public sector employee's

pension bill. Additionally the snowball effect on the increase of debt is minimal and even during 2001-2008 had a negative impact mainly due to the low interest rate environment that Greece was operating in anticipation of EMU. Especially so following EMU until the beginning of the global financial crisis combined with the high growth rate.

Next a closer look at the various components of the Greek debt-to-gdp ratio is undertaken along with how they are expected to develop over the next period of five years.

Figure 10. Greek debt-to-gdp ratio since 1991 and its decomposition



Source: European Commission, AMECO, 2011

4.2 Greek Debt Dynamics (λ)

4.2.1 GDP growth (g)

According to the response of the Greek Government to the updated Stability and Growth Program submitted at the beginning of 2010, the return of satisfactory growth from 2011 will gradually dilute the ratio of general government expenditures to GDP. This is expected to materialize without necessitating their decline in absolute size or even permitting their increase after 2010. At the same time the increase of taxable incomes and profits, along with the growth of GDP, will permit an increase in the

revenue of the general government not only as a percentage of GDP but, most significantly, by a sizeable absolute number.

Another path to the reduction of debt is via the snowball effect which is the contribution of interest and nominal growth (*i-g)*. The success of this strategy evidently depends crucially on the ability of the economy to return to the projected, as in the Stability and Growth Program, positive growth rates after 2010. However, one cannot predict with relative certainty. According to the *Hellenic National Reform Programme 2011-2014* (April 2011) the forecast for 2011 is -3% and for 2012 is +1.1%. The main question here is what will be the sources of growth: investment is falling, -16% in 2010; imports are also falling to -4.8% for 2010 from -18.6% for 2009 whilst exports recorded a rebound in 2010 at 3.8% of GDP (as opposed to -20.1% in 2009) and they are expected to exceed 6% in 2011 but they cannot compensate for the severe domestic expenditure contraction. If the Euro continues to recover as it has been observed during the recent months, things will get worse. What is more close to reality is Buiter's et al. (2011) forecast for a negative real growth of -1% in 2012.

4.2.2 Primary budget (π)

The primary budget is expected to be -0.9% in 2012.[7] This can be mainly achieved with strengthening the revenue administration so it can succeed in big high revenue increases as well as with budgetary discipline with a focus on expenditure cutting.
Greece collects less direct and indirect taxes as percentage of GDP when compared to the average of EU with tax evasion being a systematic problem.

European Commission shows the collection of tax-revenue as percentage of GDP which is almost half the amount that the EU member-states collect[8] and so there is plenty of room for the Greek tax authorities to broaden the tax base and substantially increase revenue from direct taxes, a fact that will help the country to appear a positive primary balance at least from 2012.

[7] Bruegel Institute (http://www.bruegel.org/) estimates that to bring debt down to 60%, the primary surplus should be strongly positive, around 8.4% during 2014 – 2034. No country except Norway, has managed to keep such a surplus for so many years and without any negative repercussions on growth as it requires large expenditure cuts and huge tax increases.
[8] European Commission, *Taxation Trends in EU*, Brussels, 2010,

Here it is also worth noting that the income tax in 2010 compared to 2009 was reduced by 13.9% and the estimated tax evasion during the same period increased by a magnitude of 1 billion euros. The tax amnesty in 2010 contributed almost 1 billion Euros (0.4% of GDP) to revenues, but it also provided the intensive to continue such a practice and thus it is expected to reduce further than the above table shows, future tax compliance. One should not forget that any big success on that issue; that is succeeding in closing the tax loopholes, will always drag down gdp, which on the other hand, is absolutely crucial to service the debt.

4.2.3 Interest rates (i) - Spreads

At the end of 2009 there was a significant rise of 10-year Greek bonds rates that were implying approximately a 25% possibility that the Greek government will default on its debt. Since the adoption of the *Economic Adjustment Programme for Greece* in May 2010 the financial markets are shut down but in the secondary market spreads are sky high. Apparently, interest rates as shown in Table 4 are not serviceable rates as they cannot be matched by any realistic gdp nominal growth even if the Greek economy recovers pretty soon, as it is scheduled in the Stability and Growth Programme.

Table 4. Interest payment on debt and Interest as a % of GDP

Year	Interest payment on debt	Interest as a % of GDP
2010	14.2 billion	5.5%
2011	15.8 billion	6.5%
2012	17.0 billion	7.5%
2013	19 billion	8.0%
2014	20 billion	8.3%
Total	86 bil., 27% of current debt	-

Source: Own estimations from Ministry of Finance, Annual Budget Report 2011, Athens 2011.

4.2.4 Stock flow adjustments

No privatizations occurred in 2009 or 2010 that could help with the reduction of the debt. However, for the period 2011-2015 they are expected to reach 50 billion Euros according to *The Economic Adjustment Programme for Greece - Third Review* (EC, 2011), which corresponds to a 14% reduction to the debt magnitude (assuming a final debt of 365 billion Euros or around 22% of the debt-to-gdp reduction. This seems unlikely as the Greek government does not seem to be ready for it – may be by only a fraction of this amount; it is currently estimated at 13 billion Euros, and it is rather unlikely that there will be sufficient interest to attract potential investors in an environment of high regulation and low competitiveness as it was explained earlier.

Another worrying aspect is the level of the expenditures kept-off budget (contingent liabilities which for 2011 are expected to reach 3 billion Euros, i.e. 1.2% of GDP. They will originate from the rest of public organizations that will submit for the first time their balance sheets. Also, part of state expenditure cuts were achieved up to now by not paying bills both to the private sector and to the regional and local authorities. Thus out of budget-expenditures are expected to bear a supplementary weight during 2011.

Overall it would be more realistic to expect a stock flow adjustment of around 20 billion Euros, which would reduce the debt-to-gdp ratio by 9-10% and therefore the stock flow adjustments would have a sizeable effect on the reduction of debt. Unfortunately it is a one-off event and given the existing level of debt-to-gdp ratio its overall impact to the debt-to-gdp ratio will not have such a crucial impact in terms of reducing the debt-to-gdp ratio.

4.3 Debt sustainability scenarios

Now let us apply the key elements of the Stability and Growth Program on the debt dynamics over the period 2011-2015. During 2011 the debt-to-gdp ratio is expected to be at around 150%. The fiscal adjustment program includes consolidation measures amounting cumulatively to 11% of GDP by 2013, with 3.9% in revenue measures and 7.1% in expenditure measures. The (additional) effect of these measures is 2.5% of GDP in 2010, 4.1% in 2011, 2.4% in 2012, and 2.0% in 2013. Also according to the

plan a primary surplus of around 5% of GDP is expected to be maintained after 2013. However, this goal might not be achieved as at the end of 2009 the projected budget deficit was 12.7% (revised finally at 15.4% vs. expected 5.1% of GDP while the 2010 deficit was finally above 10%) and a more realistic figure for this period would be an average surplus of around 3%. We create three scenarios, which are presented along with the relevant assumptions and calculations in Appendix A:

The first scenario (Scenario IMF A) is the base reform scenario, with an average primary surplus of 5% and zero snowball effect (i-g=0). When no stock flow adjustments are assumed the debt-to-gdp ratio would drop to 125% and with successful privatization it would drop to 105%. In both cases the rate of decline is not sufficient to allow timely repayment of the received assistance and return to a ratio that is below 100% or closer to the perceived ideal of 60%.

The second scenario (Scenario IMF B) is a more realistic scenario with an average primary surplus of 3% and a snowball effect (i-g) of +3% to reflect concerns of lack of a timely and strong gdp growth. When no stock flow adjustments are assumed, the debt-to-gdp ratio would drop only to 150% and with stock flow adjustments of 10% it would drop to 140%. It can be clearly seen that in both cases debt cannot be sustainable unless additional measures are taken.

The third scenario (Scenario IMF C) is an optimistic reform scenario, with an average primary surplus of 5% and a snowball effect (i-g) of -2%, which is the result of a robust growth of the economy based on structural and institutional reforms that boost productivity, significantly improve competitiveness, and boost the financial sector. When no stock flow adjustments are assumed, the debt-to-gdp ratio would drop to 115% and with successful privatization it would drop to 95%. The last case is the only case that the debt-to-gdp ratio falls marginally below the 100% threshold but yet its effectiveness is minor.

Recently, plans emerged about the reduction of the interest payments with the decrease of the rate of interest along with the increase of the loan period. As there are still ongoing discussions about the implementation of such plan between Troika members, Greece and private investors, it is difficult to quantify exactly the impact.

However, we added two more scenarios to address these developments assuming that the interest payments will be reduced.

Thus, the fourth scenario (Scenario IMF B plus an interest payment reduction of 5%) is the more realistic scenario with an average primary surplus of 3% and the snowball effect (i-g) changing from +3% to – 2%. The 5% reduction of the snowball effect will be mainly due to the reduction of the interest payment as percentage of GDP (see Appendix A for more details). When no stock flow adjustments are assumed, the debt-to-gdp ratio would drop only to 125% and with stock flow adjustments of 10% it would drop to 115%. Although it is clearly an improvement on the debt-to-gdp ratio the debt is still not sustainable.

Finally, the fifth scenario (Scenario IMF C plus a severe interest payment reduction of 7%) is the optimistic reform scenario, with an average primary surplus of 5% and the snowball effect (i-g) changing from -2% to -9%. The rather optimistic 7% reduction of the snowball effect will be mainly due to the reduction of the interest payment as percentage of GDP originating from achieving the 30 year repayment period along with an average low interest rate of 4.5% for all the renewed bonds; this is explained in Appendix A. When no stock flow adjustments are assumed the debt-to-gdp ratio would drop to 80% and with successful privatization it would drop to 60%. This is the only scenario that the debt-to-gdp ratio falls below the 100% threshold and becomes sustainable and if additionally the privatization is successful along with no other out-of-budget expenditure surprises the debt threshold that the global financial markets would find it is sufficient is reached. All the scenarios are presented in Appendix A.

Therefore even after a reduction of the interest payments a realistic scenario indicates debt unsustainability and only the most optimistic scenario brings the debt-to-gdp ratio to the acceptable levels. As most likely the true state will be closer to scenario 4, it seems unlikely that the debt-to-gdp ratio will fall below the 100% at the end of the 2015 or at best it will fall marginally below this threshold. Hence, in the long run a serious debt restructuring might be the only way forward.

4.4 Is the debt sustainable?

Based on the above whilst looking at the debt dynamics a massive fiscal adjustment is required that will transform the substantial primary budget deficit into surplus. Also, as the official support that Greece receives has the form of loans that must be repaid with interest, that is lower than the one that financial markets would require but at least compensates official creditors for their own cost of funds, the interest part of the snowball component will be disproportionally large compared to the nominal gdp growth. Thus, the snowball effect will always tend to increase the debt and cannot be ignored and the size of the primary surplus is required to be even higher. Hence, the option that needs to be seriously explored is to focus on ways of reducing the interest payments. However, even in such case it would be doubtful whether over a longer period of time the debt will be sustainable. With the current -3% GDP forecast for 2011, the endgame would rather entail a large debt write-down, sooner or later in order to bring the debt-to-gdp ratio to a more 'healthy' level that in the long run would restore the faith of the financial markets to the sustainability of the Greek debt.

5. Policy recommendations and conclusions

In this paper we have started out with a brief description and analysis of the prosperous years 1995-2008 where high growth rates along with high productivity prevailed. The prosperity was mainly due to demand injections like cheap credit, money from tourism and shipping boom, EU structural funds, the boost from the Olympic Games and Athens area infrastructure, limited reforms (banking, telecoms, some Private-Public Partnerships but that is it more or less) and most importantly extensive public borrowing.

At the same time the falling competitiveness of Greece's economy was indicated by persisting inflation differentials and double-digit current account deficits and budget deficits as well as close to zero net FDIs. The country in terms of competitiveness, business environment, administrative cost and governance surveys was consistently ranked at a level that is disproportionally low when compared to its per capita GDP or even to GDP per worker.

Additionally we observe the presence of institutional weaknesses and poor governance along with the incidence of extensive market regulation that forced on both the real economy and the economic institutions obsolete and rigid structures along with corruption. Both of the above weaknesses were present for a number of decades and were disregarded or set aside by looking only at the spectacular gdp growth but they consistently lead to the actual output of Greece to be lower than its potential output (persistent inefficiency).

Finally, the high productivity is rather a deception as during that period it is the result of a combination of an artificially ballooning GDP (nominator) and low labour force participation rate (denominator). Very few unregulated and tax evading self-employed (over)work and few salaried employees work in Greece as product, service and as a consequence, labour markets are extremely closed and rigid. So, unemployment and non-employed rates are very high, especially among unconnected young.

All of the above had a major negative impact to the primary deficit surplus/deficit and at the end of 2009 projected budget deficit was 12.7% vs. expected 5.1% of GDP (currently at 15.4%). Initially the deterioration of the budget deficit and its impact on public debt was masked by the low borrowing interest rate environment that resulted by the EMU accession. However, as most EU countries seemed to get out of recession at the end of 2009, Greece did not follow and the result was the widening spreads during spring 2010. The Greek debt-to-gdp ratio from 71% in 1990 exceeded the 100% threshold in 2000 and it is expected to reach 158% in 2011 and even higher in 2012. Looking through the debt dynamics identity, the contributing components of the debt (structural and cyclical primary deficit ratio, snowball effect, which is mainly affected by the interest payments and nominal growth, and the stock flow adjustment ratio) are discussed. We constructed five scenarios regarding the level of public debt at the end of the 2011-2015 that is commonly accepted that Greece will return to global financial markets to finance its debt. We find that only under a very optimistic scenario of robust growth of the economy, based on structural and institutional reforms that boost productivity, significantly improve competitiveness, and boost the financial sector, as described in the *Growth and Stability Program*. All these along with a successful privatization of 50 billion Euros, the public debt to gdp ratio can reach the 60% threshold that the financial markets find comfortable. Alarmingly the

more realistic scenarios put the debt to gdp ratio above the 100% threshold and this raises many questions about the sustainability of the Greek debt.

So, the only possible options the Greek economy have are the following: open markets, reduce unnecessary regulation, encourage reform in education and job creation (through any kind of tax credits), fix public finances by cutting public waste and taxing the untaxed privileged so as not to hit domestic demand. Create incentives for the black economy to incorporate to the official one. Also build well-working, independent institutions and an administration that is not corrupted by the rents closed market create now.

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Appendix A

Applying the debt dynamics described in equation (1) on the five debt scenarios the level of debt to gdp ratio at the end of 2015(λ_2015) is given in the following tables, 5 and 6. Table 5 assumes no stock flow adjustment whilst Table 6 assumes that privatization will be fully successful raising 50 bil. euros along with minor budget expenditures (5 bil. euros) related adjustments (scenarios A and C) or partially successful raising 25 bil. euros along with the same minor budget expenditures related adjustments (scenario B) .

Table 5 – scenarios for Debt dynamics (2011 - 2015)

Scenarios without financial adjustments	Annual dλ/dt	λ_2015	-π	i-g	f
1 IMF scenario A	-5%	125%	-5%	0%	0%
2 IMF scenario B	0%	150%	-3%	3%	0%
3 IMF scenario C	-7%	115%	-5%	-2%	0%
IMF scenario B plus interest reduction 4 5%	-5%	125%	-3%	-2%	0%
IMF scenario C plus interest reduction 5 7%	-14%	80%	-5%	-9%	0%

Table 6 – scenarios for Debt dynamics (2011 - 2015)

Scenarios without financial adjustments	Annual dλ/dt	λ_2015	-π	i-g	f
1 IMF scenario A	-9%	105%	-5%	0	-20%
2 IMF scenario B	-2%	140%	-3%	3%	-10%
3 IMF scenario C	-11%	95%	-5%	-2%	-20%
IMF scenario B plus interest reduction 4 5%	-7%	115%	-3%	-2%	-10%
IMF scenario C plus interest reduction 5 7%	-18%	60%	-5%	-9%	-20%

1 Scenario IMF A: the base reform scenario, with an average primary surplus of 5% and zero snowball effect (i-g=0).

2 (Scenario IMF B: a more realistic scenario with an average primary surplus of 3% and a snowball effect (i-g) of +3% to reflect concerns of lack of a timely and strong gdp growth.

3 Scenario IMF C: an optimistic reform scenario, with an average primary surplus of 5% and a snowball effect (i-g) of -2% that is the result of a robust growth of the economy based on structural and institutional reforms that boost productivity, significantly improve competitiveness, and boost the financial sector.

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Scenarios 4 and 5 assume that approximately 210 bil. euros of the Greek debt is due to be refinanced during the period 2011-15 with an average interest rate of 13% and average length of 7.5 years. Following the latest efforts to reduce the Greek debt, a realistic scenario would be that these bonds will be replaced by an average interest rate of 7% and average length of 15 years (or equivalently interest rate of 10% and average length of 30 years) delivering an overall reduction to the snowball effect of 5%. An optimistic scenario would be that these bonds will be replaced by an average interest rate of 4.5% and average length of 30 years delivering an overall reduction to the snowball effect of 7%.

4 Scenario IMF B plus an interest payment reduction of 5%: the more realistic scenario (2) with the snowball effect (i-g) changing from +3% to – 2%.

5 Scenario IMF C plus a severe interest payment reduction of 7%: the optimistic reform scenario, with the snowball effect (i-g) changing from -2% to -7%.

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