

The Greek Sovereign Debt: Are There Really Any Options?♦

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ABSTRACT

Debt Overhang is a controversial issue in the eurozone countries and is considered as one of the factors which created the current economic crisis. How to deal with sovereign debt has been debated both at the theoretical and policy making level. This paper looks at the Greek debt and four options are discussed: (a) unilateral default (b) unilaterally imposed austerity measures (c) restructuring through negotiating and (d) a tax on wealth to pay for the debt. Optimal options depend on the borrowing rate, debt maturity and debt haircut.

Key words: eurozone, debt, Greece

JEL Classification: H63, E62, H26, H21

1. Introduction

This paper examines Greece's options to cope with the current excessive public debt. Four policy options are discussed: (a) unilateral default (b) unilaterally imposed austerity measures (c) restructuring through negotiating and (d) a tax on wealth to pay for the debt.

The theoretical and empirical economics literature discusses the advantages and disadvantages of alternative policy actions to manage debt burdens but its conclusions are contradictory. The most recent studies quite often make special reference to the current Greek debt crisis.

Two reasons can explain this interest. First, the introduction of the euro in 2002 is considered a new experiment in economic and monetary union systems with strict fiscal

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rules which would prevent the accumulation of public deficits. The amassing of such huge sovereign debts in the eurozone came as a big surprise. Second, the debt crisis of the periphery of the eurozone countries may contaminate the core countries of the eurozone and therefore undermine the mere existence of the euro itself, forcing governments to return to national currencies.

Most importantly for this study is the economics literature that discusses methods and policies to get the troubled countries out of the debt crisis while retaining the existing structure of the economic and monetary union. In reviewing this literature, an important conclusion emerges. Under certain realistic conditions, all policy alternatives may have similar economic impacts which raises the question whether there are really any options to cope with debt overhang. This is the reason why many authors have concluded that the choice is not an economic one but political, especially in the rich countries of the eurozone, as it has been argued by Buiters and Rahbari (2013).

This study emphasizes two important political issues of debt management. First, different schemes of debt restructuring can be ranked according to intergenerational distribution of debt burden. The current generation has the political power to shift the burden of its debt to the future, and to unborn generations who have no political power to determine present policy choices. Second, political power differences of the various present day social classes can support policies which shift the burden to classes which are underrepresented in the political decision making. It is argued that both political aspects have determined the recent agreements with Greece's creditors and have shaped the current political discussions of debt restructuring through negotiations.

This paper is organized in nine sections, including this introduction. Section 2 discusses the main issues of excessive sovereign debt through an eclectic review of the relevant economics literature and presents Greece's policy options to manage its excessive debts. Section 3 looks at the data of sovereign debt and section 4 examines the relation of debt burden to economic growth, investment and employment. Sections 5 to 8 evaluate the four policy options to deal with the excessive Greek debt: unilateral default, unilaterally imposed austerity measures, debt restructuring through negotiations, and a tax on wealth as a unilateral action by the Greek policy authorities to cope with the excessive sovereign debt. Section 9 concludes.

2. The Excessive Public Debts in the Economics Literature

The economics literature has extensively discussed the issues surrounding excessive sovereign debts, including the development of an optimal theory of public debt¹. The empirical part of this literature has provided optimal threshold ratios of debt to GDP ratios which range from 60% to 90%. Above these ratios, the debt is considered excessive and becomes a burden to the economy. Alternative ways of dealing with debt overhangs have been suggested and their costs and benefits have been analysed. This study discusses only

¹ Debt financing of government spending should be used to smooth the business cycle by generating deficits when the economy is in a recession and creating surpluses when output grows above a given positive rate. In the long run, government debt defined as the accumulation of annual government deficits plus any interest should be equal to zero. Aiyagari and McGrattan (1998) developed a model to estimate optimal levels of public debt parameterized to explain the time of US public debt. Similar is the work of Martin (2009) who develops what he calls a positive theory of government debt. Rieth (2014) and Hiebert et al (2009) have built models that resemble the characteristics of the European Union and account for optimal long run public debt.

those options which are considered relevant to the current Greek debt crisis². Four such options are considered as relevant:

- a. Unilateral default on all or part of sovereign debt.
- b. Unilaterally imposed austerity measures.
- c. Debt restructuring through negotiations.
- d. A tax on wealth to pay the excess public debt.

These are discussed with some detail in later sections. It should be mentioned at the outset that there is an important distinction between unilateral default and default based on an agreement between the debtor country and its creditors. In this study, the latter is considered as one of many types of debt restructuring rather than default. The economic and political implications of unilateral default and "default" by negotiation are substantially different.

These four policy options to cope with excessive debts have been debated both in Greece and the rest of the eurozone countries. Political parties have suggested all options from a unilateral default to a wide range of debt restructuring and negotiations. Political antagonisms include, among other things, who can negotiate better with creditors, which, in Greece's case, are the other countries of the eurozone. Unfortunately, the economics literature has very little to offer to this political debate since one of its conclusions is that this is mostly a political issue. As we shall see below, this is because, under certain assumptions, all policy options to deal with debt overhang may have exactly the same overall economic impact. A number of issues are critical in evaluating the economic impact of the various alternatives to manage excessive sovereign debt. Some of them are discussed in the remaining part of this section.

First, the size of the gross public debt is used as an indicator of the debt burden but it is not always an appropriate indicator. Two countries with similar gross public debt burdens, expressed as a percentage of their national GDP, may not feel the same pressure if one government has more total financial assets to cover its financial liabilities. Thus, one should look at the net public debt. According to IMF's World Economic Outlook (October 2014), Japan has a very high gross public debt to GDP ratio, close to 250%, but a much lower net public debt to GDP ratio, about 140%. On the other hand, Greece's ratios are 175% and 170% respectively. Similarly, the net and gross public debt may not account for the total asset liability of a country. In many cases, private debts of national agents (households and firms) should be taken into account because, sooner or later, these debts become banking problems, and end up as public debts. In addition, government guarantees of private debts, future pensions and health liabilities turn out to be public debt liabilities and must be honored by future governments. These are hidden government debts as discussed by Reinhart and Rogoff (2011).

² For example, unless Greece leaves the eurozone, she cannot print more money to serve its debt as was the case in the past. On the other hand, the price of low Greek inflation in the eurozone years might be the debt crisis of the recent years. Aguiar et al (2014) developed a model and have shown (p. 106) that "... a country that attains higher inflation credibility by joining a monetary union, all else equal, can experience a buildup of sovereign debt as has been documented for countries like Greece on joining the euro".

Second, the distribution of the total debt between external and domestic sovereign debt is important³. Defaulting on domestic public debt does not have the same impact as defaulting on external public debt. This also relates to the denomination of public debt between national and foreign currency. After all, the government can always print more of its own currency (monetization of public debt) to serve its debt issued in its national currency. Greece, after adopting the euro, cannot monetize its debt as it did in the past.

Third, the rate of growth of GDP is very important. The debt burden decreases if the economy grows at a rate higher than the rate of growth of its debt. As will be further discussed in section four, the association between debt and economic growth is critical in deciding how policy makers and government officials can cope with excessive debts.

Fourth, a country's creditworthiness, as evaluated by rating agencies, is an important determinant of the cost of serving the debt. It affects the rate at which a country can borrow, both its public and private sector. This explains why countries with the same high debt burden borrow money at much different interest rates. As Bi (2012) has shown, in a model calibrated to match Greece's economic data, default risk premium increases at an increasing rate with the level of government debt.

Fifth, debt maturity structure is important. Shorter maturities make it more difficult to "roll over" existing debt. Longer maturities give governments more flexibility and therefore reduce the cost of serving the debt. As is shown by Niepelt (2014), the maturity structure of the debt is not neutral and an optimal smoothing of maturities of sovereign debt should take into consideration the risk and the business cycle. However, this is the normal case. Under certain economic conditions and expectations about the future course of the economy, short run borrowing may be done at a lower cost than long run borrowing. This is relevant to an arithmetic example presented in section 7 to evaluate alternative options of debt maturity in a negotiation process of debt restructuring.

Sixth, an essential distinction should be drawn between governments unable to honour their debt and those unwilling to pay it. The latter usually happens when there is a political change in the country and the new government is not willing to pay debts made by previous governments. In the past, this had led to wars ("gunboat diplomacy") as is accounted by Mitchener and Weidenmier (2005). They analysed what they call "super sanctions" such as gunboat diplomacy, external fiscal control over a country's finances, asset seizures by private creditors, and trade sanctions. This was a common practice in the 1870-1913 period. In 1898 such a super sanction was imposed on Greece after a disastrous war with Turkey in 1897. Unlike the previous Greek debt crises, the recent one occurred in a period of peace and unprecedented accumulation of wealth. If Greece defaults, it will be because she does not want to pay and not because she cannot pay. Greece's lowest per capita income of the 21st century is higher than its highest value of the 20th century. Never before had Greece accumulated so much wealth as it has done in the 21st century. This wealth can be used to pay for the debt as explained below in section 8 of the paper.

Seventh, the issue of contagion is very important. To what extent a debt crisis of one country is transmitted to other countries is a matter of great significance. In the eurozone this contagion has received a lot of attention and many have argued that if Greece is not helped, then the entire experiment of the common currency will collapse. Beirne and Fratzscher (2013) examine the role of contagion for sovereign borrowing rates during the debt crisis. They found that other determinants played an important role in the eurozone and contagion

³ Dias et al (2014) construct a number of alternative measures of external debt for a number of countries.

has had little impact. Similarly, Gorea and Radev (2014) found that trade interconnections between the eurozone countries are more important in transmitting shocks from the periphery to the core of eurozone rather than expectations of future debt defaults.

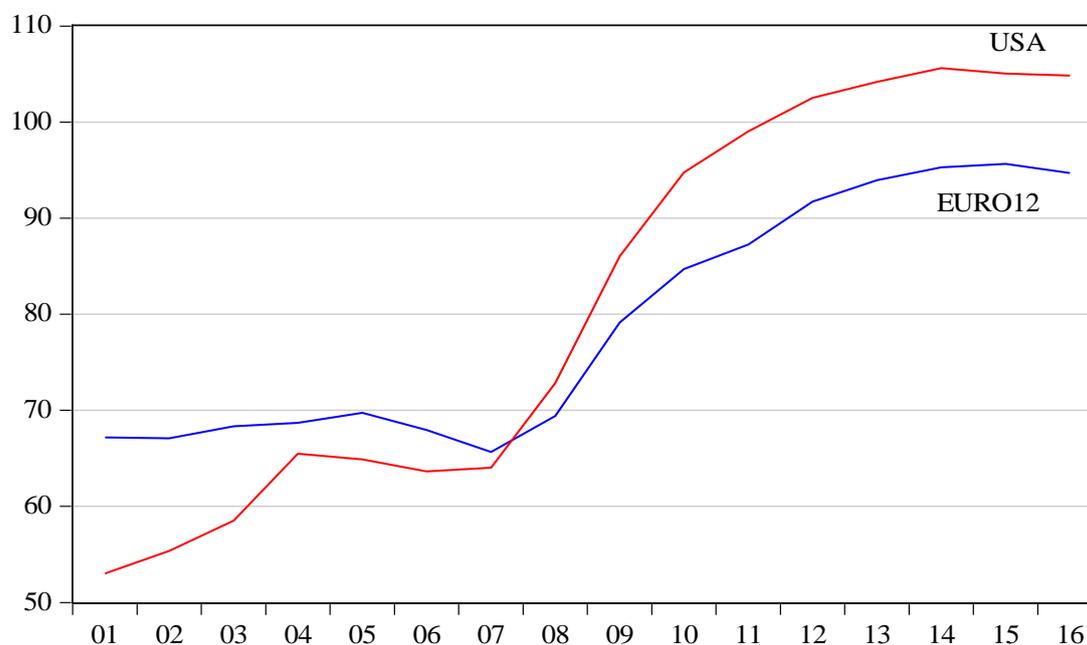
The discussion of these issues and the conclusions reached depend very much on the level and growth of the debt burden. Higher debt to GDP ratios and high rates of growth of these ratios have much stronger negative economic impacts than lower ratios and growth rates of debt. The data on debt to GDP ratios show that lower rates might have a positive impact on economic growth. Data on debt are presented in the next section. The debt impact on economic growth is examined in section 4 of the paper.

3. Some Salient Data on Public Debt

The debt burden is usually measured as the ratio of gross public debt over GDP. Statistics show that the ratio of debt to GDP has been constantly increasing in the past few decades, especially in the developed world. Usually, debt rises as the result of wars, natural disasters, and other unexpected events. In an interesting article, Azzimonti et al (2014) have explained the recent rise in gross government debt as the result of a historically unparalleled liberalization of global financial markets and the increased income and wealth inequality in some developed countries.

Figure 1 depicts the debt to GDP ratios of the eurozone countries and the USA. Both ratios were below 70% before the crisis of 2007. Since then, the debt burden has almost doubled, more so in the USA.

Figure 1 Eurozone's and USA's Public Debt (% of GDP)



Source: Eurostat (Euro12) and IMF (USA)

The average debt burden of the eurozone is below the USA burden but the problem is larger in the euro area because there are alarming differences between the euro member countries. Table 1 shows the actual debt burden from 2001 to 2013 and IMF's forecasts from

2014 to 2019. Reinhart et al (2012) suggest a 90% threshold. Above this ratio, the debt becomes excessive. As can be seen from Table 1, 7 out of the 11 eurozone countries have had debt to GDP ratios that exceed 90%. Greece, Italy and Portugal stand out as the big debtor countries of the eurozone. Austria, Finland, Germany and the Netherlands have ratios below 90%.

Table 1. Gross Public Debt to GDP (%) of Selected Eurozone Countries

	Austria	Belgium	Finland	France	Germany	Greece	Holland	Ireland	Italy	Portugal	Spain
2001	67	106	41	56	59	104	48	33	108	51	56
2002	66	103	40	58	61	102	48	31	105	54	53
2003	65	98	43	63	64	97	49	30	104	56	49
2004	65	94	43	64	66	99	49	28	104	57	46
2005	64	92	40	66	69	101	49	26	106	63	43
2006	62	88	38	63	68	107	45	24	106	64	40
2007	60	84	34	63	65	107	43	24	103	68	36
2008	64	89	33	67	67	113	55	43	106	72	40
2009	69	97	42	78	75	130	56	62	116	84	54
2010	72	97	47	81	83	148	59	87	119	94	62
2011	73	99	47	84	80	170	61	99	121	108	70
2012	74	101	52	89	81	157	67	111	127	124	86
2013	74	101	55	92	78	175	69	116	133	129	94
2014	80	102	58	95	76	174	69	112	137	131	99
2015	79	102	59	98	73	171	70	112	136	129	101
2016	77	101	60	99	69	161	69	109	134	126	102
2017	75	99	59	99	66	152	68	106	131	124	102
2018	73	97	59	98	63	145	67	102	129	122	101
2019	72	94	58	96	60	135	65	97	126	119	100

Source: IMF (forecasted values after 2014)

Reinhart et al (2012) consider an excessive debt to GDP ratio as retarding economic growth. They also found that this may last over a decade resulting in massive loss of output and of course employment. The relation between debt overhang, economic growth and employment is further examined in the next section using Greek data.

4. Public Debt, Economic Growth, Investment and Employment

What is wrong with public debt? If there are no costs, all sovereign nations can borrow money, either from their own citizens or from other nations' citizens, and then default. If this is the case, why would anybody then lend money to any government? Apart from all other costs, to be discussed later, public debt must have an impact on economic growth. There are at least two channels through which excess public debt may have an impact on economic growth. The first is through the interest rate. An excess debt requires a higher risk premium by creditors and therefore a higher interest rate. In case of a default, these rates skyrocket to such an extent that the country is forced out of the international capital markets. High interest rates reduce investment demand and therefore economic growth. Second, an excess debt absorbs the available domestic saving funds to finance the excess government spending. Unless public spending is used more efficiently than private spending (investment), an excessive debt will reduce economic growth.

Of course, there are other mechanisms through which public debt may affect economic growth. If an excessive public debt is an early indicator of future political and social

uncertainty, then the "animal spirits"⁴ of investors are tamed and they postpone their investments. Recently and related to Keynes' animal spirit theory, Beaudry and Portier (2014) examine how optimism and pessimism triggered by news, can generate business cycles. Gunn and Johri (2013) relate these expectations to news about future sovereign defaults. Thus, bad news about future possible default even if they are not substantiated, raise the risk premium on both public and private debt, making it more costly to borrow in order to finance investment projects. Recession is the result.

The economics literature has debated the association between economic growth and debt burden. The evidence is contradictory. For example, Puente-Ajovín and Sanso-Navarro (2015) and Panizza and Presbitero (2014) using data from OECD countries found that the alleged negative impact of high public debts on economic growth disappears once endogeneity is taken into consideration. In other words, it is not the high debt that causes low economic growth but the reverse, i.e. low economic growth leads to the accumulation of high public debts. Or a third factor, such as a banking crisis, may cause both to move in opposite directions which shows up as a pseudo negative correlation between public debt and economic growth. Puente-Ajovín and Sanso-Navarro (2015) do find a negative impact of private debt on economic growth. If private debt is affected by public debt, then, even indirectly, there is a casual negative relation from sovereign debt to economic growth.

DeLong and Summers (2012) assert that the relation is positive under certain conditions which depend on (a) the borrowing rate of the country, (b) its long run growth rate, (c) the tax rate, and (d) the gap between actual and potential output. Consequently, an increase in public debt has a positive impact on economic growth. So much so that the extra economic growth can pay back the excess debt generating a net positive output.

Two questions arise from such analyses. First, does this fiscal expansion apply only to recessions⁵ or can it be implemented at any phase of the business cycle? Second, is the impact non-linear? For example, for modest debt levels, is the economy growing while the relationship turns negative, if the debt exceeds a certain threshold? A very common argument put forward to criticize austerity measures in Greece was the recession. Some argue that the depressed Greek economy needed a fiscal stimulus and not a fiscal retrenchment. The arguments go along the lines presented by DeLong and Summers (2012) and they have been used by many political parties in Greece to support an expansionary fiscal policy. However, the Greek case was just one step before the cliff with skyrocketed borrowing rates. Who would then have financed an expansionary policy? Where could the money come from? The analysis of DeLong and Summers (2012) applies only to the USA. It is interesting to note that the authors conclude on page 271 that "A government that must borrow at the terms of a present-day Greece or Spain—or that fears that even marginal additional borrowing will produce a market reaction that will force it to borrow on such terms—will find the arithmetic of expansionary fiscal policy unpleasant indeed. But there is no such wedge for the United States today". Unfortunately for Greece, it seems that fiscal expansion is not an option at all unless someone can send manna from heaven. It seems that

⁴ A term used by Keynes in his General Theory: "Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits—of **a spontaneous urge to action rather than inaction**, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities". (bold added).

⁵ DeLong and Summers (2012) look at fiscal policy and public debt in a depressed economy. One of the conclusions of their study (p. 234) was that "Only when a government must pay a substantial premium over the social rate of time discount in order to borrow is the economy unlikely to benefit from expansionary fiscal policy at the zero bound". The key question is what if the country cannot borrow at all as was the case of Greece in 2010.

the other countries of the eurozone are far from being considered heaven. The same applies to countries such as Russia, China, Latin America and Southeast Asia that some political parties in Greece have been proposing as potential alternative sources of loanable funds.

A number of additional questions emerge from this literature. First, what is the nature of association (correlation) between public debt and economic growth? Is it linear or non-linear? Some studies have demonstrated a non-linear impact: low debt to GDP ratios have a positive impact but high ratios slow down economic growth and there is a threshold point over which the impact becomes negative. Second, does the existing correlation imply causality? In other words, is it slow economic growth that builds up the excessive debt to GDP ratio or the other way around? Yet again, there are no conclusive answers to these questions. Third, does the relation between economic growth and excessive public debt differ between countries? Evidence shows that this might be the case as the studies by Reinhart et al (2012) and many others have demonstrated. Fourth, is the apparent relation between the two variables a pseudo relation, or even worse, is it a tautology? For example, a small open economy faces a negative shock such as a drastic reduction in international tourist flow which reduces GDP. By its arithmetic construction (definition), the debt to GDP ratio will increase along side with a slowdown in economic growth.

The purpose of this section is not to provide a survey of this literature. For our purposes here, it suffices to conclude with the summary of Reinhart et al (2012, p. 81). They have stated that "We would not claim that the cause-and-effect problems involved in determining how public debt overhang affects economic growth have been definitively addressed. But the balance of the existing evidence certainly suggests that public debt above a certain threshold leads to a rate of economic growth that is perhaps 1 percentage point slower per year. In addition, the 26 episodes of public debt overhang in our sample had an average duration of 23 years, so the cumulative effect of annual growth being 1 percentage point slower would be a GDP that is roughly one-fourth lower at the end of the period". As for the differences between countries the authors conclude on page 76 that " ... since 1848 (when the public debt data is available), Greece leads the way with 56 percent of the debt/GDP ratio observations above 90 percent".

Then one may ask, why is this the case? What is so different about Greece? Too many wars might be one reason, more than any other country in the developed world. Even in the current long period of peace years (over 60 years), Greece spends proportional more for its armed forces to face an alleged threat from Turkey. Further research is required but the current high Greek military spending might be a good starting point for such an analysis⁶. For example, throughout this postwar period of prosperity and peace, Greek military expenditures accounted for over 5% of GDP, the highest in the eurozone of an average of about 2.5%. If Greece were to spend this average, instead of the 5% it has spent, it would save 5 billion euro annually. The accumulated savings over the postwar period (since 1950 for Greece because its World War II ended in 1949), would have more than matched the entire current Greek debt of 320 billion euro. Thus, one may conclude that the Greek debt is the result of excessive military spending. Furthermore, most of this spending was to pay imports from countries like Germany and France which happen to be the biggest creditors of Greece and with procedures which the Greek and German courts have found as corrupted, lacking transparency, and full of bribes which raised the price for the Greek tax payer. This is

⁶ Töngür et al (2015) have examined military spending for a sample of 130 countries, Greece included, from 1963 to 2000. They find that military spending does depend on political regimes. They also find evidence that military expenditures increase with the perception of external threat and the military spending of foes.

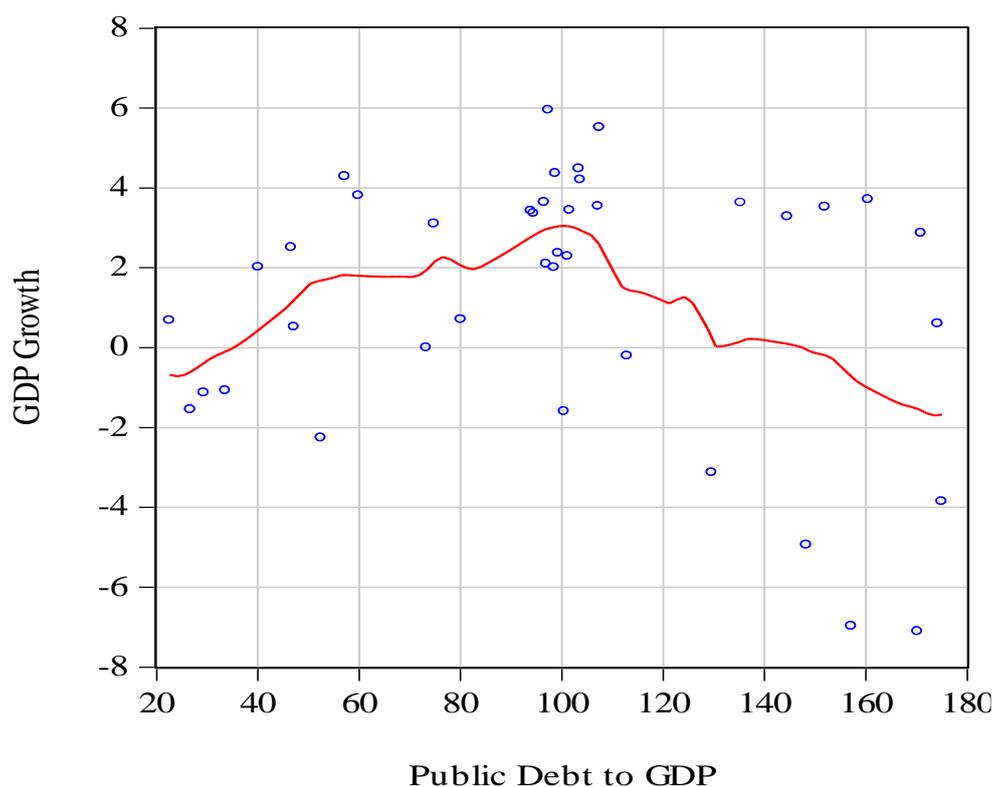
a very important issue but it requires further research that goes beyond the scope of this paper. In any case, this by no means justifies the accumulation of Greek sovereign debt.

This relation between the Greek debt to GDP ratio and economic growth is shown in Figure 2⁷. The correlation between the debt burden and economic growth is positive up to 100% debt to GDP ratio; it turns, however, negative for debt burdens higher than 100%. For low levels of public debt relative to GDP, the relationship is positive and increases at a decreasing rate, reaching a maximum around 100% and then decreasing at a higher rate. For example, increasing the debt to GDP ratio by 20 percentage points (from 80% to 100%), raises GDP by one percentage point, from 2% to 3%. However, a further increase by the same percentage (from 100% to 120%) decreases GDP growth by 1.8 percentage points (from 3% to 1.2%).

This apparent correlation does not imply causality. Teles and Mussolini (2014) have developed a theoretical model which explains that the effect on growth is limited by the size of the debt-to-GDP ratio. This growth model is tested using a list of countries, Greece included, controlling for endogeneity. They found a non-linear impact, and most importantly, as they conclude (p. 13) they "... observe an additional effect: the impact of productive expenditures on growth depends on the size of the debt-to-GDP ratio because an increase in the magnitude of productive expenditures leads to an increase in the productivity of the economy and, thus, to an equilibrium of interest rates. The latter occurs because there is no decreasing marginal return for aggregate capital in the endogenous growth models. This increase in interest rates leads to higher government spending for debt servicing; as the size of the debt increases, so does the impact of this increase on interest rates. For this reason, a higher debt-to-GDP ratio corresponds to a smaller impact of productive expenditures on economic growth".

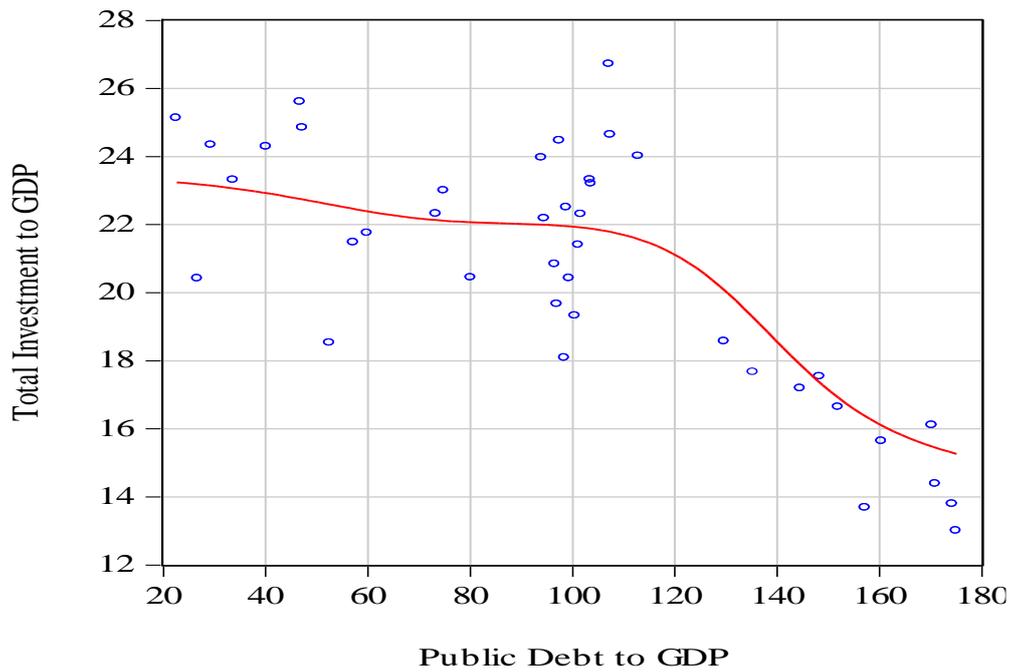
⁷ A unit root test shows that both variables are integrated of order one I(1) implying that there exists a long run relation between the two time series. In other words the correlation is not a *pseudo* association. A Granger causality test shows mixed results and the direction of causality depends on the number of lag length. Further research is required. Puente-Ajovín and Sanso-Navarro (2015) used a sample of OECD countries to examine the Granger causality between growth and debt but their study is limited because they did not examine non-linear effects and the structure of the debt. As the authors acknowledge, their study is a short run analysis, and future research should look at the long run relation of the two variables.

Figure 2 Correlation between Greek Public Debt and Economic Growth, 1980-2019



As stated above, a high debt-to-GDP ratio increases uncertainty, sovereign risk, and interest rates which all together lower private investment. Figure 3 shows the relation between the debt-to-GDP ratio and total investment as a share of GDP. A kernel fit of the scatter diagram shows that the relationship is negative at all levels of public debt burden. However, an increase of the debt-to GDP ratio up to 100% has only a modest negative impact on total Greek investment of about one percentage point. There is, however, a very strong negative correlation for debt ratios that exceed 100%. This is because the high public debt requires much higher interest rates which impinge on both the public and the private sector of the economy. The Greek interest rates became so high that default appeared to be the only possible solution. The bailout of Greece by its eurozone partners and the IMF is not a default, at least not a unilateral default. The pros and cons of the unilateral default option are examined in the next section.

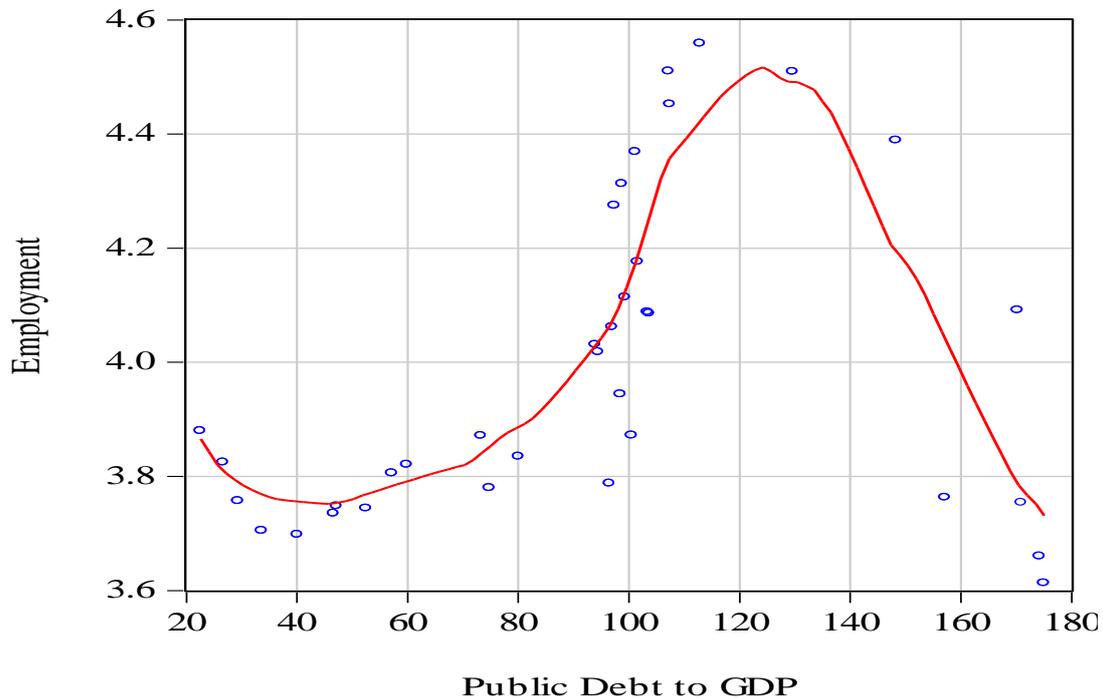
Figure 3 Correlation between Greek Public Debt and Total Investment, 1980-2019



In the current Greek policy and political debate, the high debt is related to the current plight of official employment reduction. Figure 4 shows that employment increases with debt to GDP ratio. For ratios over 120%, there is a sharp decline in employment.

Concluding the above analysis, the debt-to-GDP ratio correlation with economic growth and employment is positive for low levels of debt but it turns negative for ratios that exceed 100% of GDP. How much has the loss of Greek output been due to excessive debt to GDP ratios? Table 2 uses the 1960-2016 period of Greek GDP growth and the two thresholds: 90% suggested by Reinhart et al (2012) and 100% shown in Figure 2.

Figure 4 Greek Public Debt and Total Employment, 1980-2015 (IMF data)



During this period of 57 years, the Greek economy grew by an annual average rate of 3.1%. In 13 years (23%) there were episodes of debt to GDP ratios over 100% and in 22 years (39%) the ratios were more than 90%. Consistent with Reinhart et al (2012) findings, on average, years with debt over 100% (90%) of GDP are associated with an average annual growth rate of GDP that is 4.8 (3.6) percentage points lower than the annual rate of increase of GDP in years that the ratio is below 100% (90%).

Table 2 Greek Economic Growth and Public Debt, 1960-2016

	Overall	Above 100%	Below 100%	Above 90%	Below 90%
Mean	3.1	-0.6	4.2	0.9	4.5
Median	3.2	0.6	3.9	2.5	4.1
Maximum	13.2	5.8	13.2	6.6	13.2
Minimum	-8.7	-8.7	-6.4	-8.7	-6.4
St.Deviation	4.7	4.7	4.2	4.2	4.6
Years	57	13	44	22	35

Reinhart et al (2012) found averages for a cross section of countries of 1.2 percentage points difference. In years of excessive debt, the rate of growth of Greek GDP is on average negative for the 13 years that the debt to GDP ratio exceeded 100% and 0.9% for the 22 years that the ratio was above 90%. The results of Table 2 are similar to Reinhart and Rogoff (2010). They conclude (p. 573) that "...whereas the link between growth and debt seems relatively weak at "normal" debt levels, median growth rates for countries with public debt over roughly 90 percent of GDP are about one percent lower than otherwise; average (mean) growth rates are several percent lower". The similar results for Greece are much higher; the median loss of output is 1.6 percentage points for the 90% threshold and 3.3 percentage points for the 100% boundary.

The loss of Greek output is massive if one takes into consideration that these impacts last for a long period of time. For example, Greece's euro years (after 2000) are associated with massive public debts, which, on average, were 128% and ranged from 94% to 175%. The average growth rate of the period was 0.64%, which is 2.46 percentage points lower than the overall or long run growth rate. In terms of output loss, this amounted to an annual loss of 10 billion euro and a total of 150 billion in the euro years (2000-2014). This loss in output is almost half of the current Greek sovereign debt. This massive output loss makes the unilateral partial or total default very attractive indeed. But is it? Many political parties in Greece have suggested such an alternative course of action. Unilateral default is discussed in the next section.

5. Unilateral Sovereign Debt Default

For the purposes of this study, default is defined as a unilateral action by a sovereign state refusing to pay all or part of its remaining debt without any prior negotiations⁸. There are two types of defaults. First, countries default because they cannot afford to pay all or part of their debt⁹. Second, countries are unwilling to pay their debt even when they can afford to do so. Debt renegotiations which lead to agreements between all relevant parties for debt restructuring, including debt reliefs, haircuts and bailouts that precede an official declaration of default, are not considered to be sovereign defaults and for all economic practical purposes, they are not¹⁰. These debt management arrangements are examined later in this paper. This section examines a unilateral action of default by a sovereign state.

If Greece defaults, it will do so because of its unwillingness and not because of its inability to pay. Greece is a rich country and can generate sufficient income to pay back its debts. She has also enough physical, natural and human wealth, within its boundary as well as abroad, which can be used to buy back a large part of its current debt. As Buiters and Rahbari (2013, p. 15) have stated "... it would be wrong to suggest that sovereigns only default when it is absolutely unavoidable. In fact, it would be more appropriate that governments for the most part default because they choose to default. In rich countries at least, sovereign defaults are opportunistic, strategic or 'rational'. This applies to the European Union member states...the issue is willingness to pay (perhaps collective willingness to pay) rather than ability to pay. And since it is willingness to pay rather than ability to pay that matters, political and political economy factors (rather than purely economic factors) are of crucial importance in assessing public debt sustainability" (italics in the original).

The authors define Greece's debt restructuring as a default which is not according to the definition provided here. Greece did not unilaterally declare a pause on serving its debt. Actually, many political parties in Greece, left and right, urge the government to unilaterally

⁸ Debt restructuring before or after a default is not considered as default because this action is bilateral between the lender and the borrower. From a present value point of view, the restructuring (haircut) of debt is equivalent to a change in the present value of the debt and no matter how it is arranged, it can always be considered to be a reduction in the interest of servicing the debt. For example, a haircut of 100 billion euro of a 200 billion debt is equivalent to decreasing the interest on the debt from 5% to 2.5%.

⁹ The IMF states that countries don't go bankrupt and as the former Citicorp Chairman Walter Wriston has put it "Countries don't go out of business....The infrastructure doesn't go away, the productivity of the people doesn't go away, the natural resources don't go away. And so their assets always exceed their liabilities, which is the technical reason for bankruptcy. And that's very different from a company." (http://www.imf.org/external/np/exr/center/mm/eng/mm_dt_01.htm).

¹⁰ For example, if debt restructuring is agreed upon, then there is no cost of "gunboat diplomacy" which in modern times implies long and costly legal battles and a loss of credibility in the international trade markets.

default on debt but so far the majority of Greeks do not consider this as an acceptable political action. It is interesting to note that Bi and Traum (2012, p. 166) found that Greece is able to serve a higher level of debt than Italy but "... the political willingness to service debt is 12 percent to 20 percent higher in Italy than in Greece".

Borensztein and Panizza (2008) identified four types of costs of public debt default: reputational costs, international trade exclusion costs, costs to the domestic economy through the financial system, and political costs to the authorities. They found that "... default is associated with a decrease in growth of 1.2 percentage points per year". They conclude that the economic consequences are short and negligible. In contrast, they found dreadful political impacts for the government and above all for the Ministers of Finance. The economic costs of a default are measured in terms of the additional future borrowing costs, including the cost of exclusion from the international capital markets. But these costs have not been accounted for in the international empirical literature as many surveys of the literature have shown¹¹.

Similar are the results found by Sandleris (2012). He classifies the costs into three types: (a) penalties by creditors; (b) information content of defaults; (3) domestic agents sovereign bond holdings. He concludes that "The empirical evidence seems to suggest that the costs generated in the aftermath of defaults by traditional mechanisms such as trade sanctions or exclusion from credit markets have not been significant in recent decades. Information revelation and the effect of defaults on domestic agents' holding debt, particularly when the holders are banks, seem to be the main costs of sovereign defaults. Avoiding these costs seems to be the reason that deters defaults".

Statements like these explain why extreme left and extreme right oriented political parties in Greece demand full or partial unilateral default on sovereign debt. If the above evidence is accurate, then default seems to be the best option. Actually, the best long term option is to design a series of recurring defaults. If there were no penalties for defaulting countries, then a strong moral hazard effect would exist, and all countries would default on their debt. Too good to be true! Lenders will demand a higher premium for countries with a bad default history. Cruces and Trebesch (2013) found just that, using a new data set which includes all debt restructuring from 1970 to 2010. They found that higher defaults (haircuts) are associated with higher borrowing costs and longer exclusion from the international capital markets. Therefore, debts which are forgiven will not be forgotten. If haircuts demand much higher interest rates, unilateral defaults would require even higher.

Unilateral default will result in much higher future borrowing costs so much higher that the country will be excluded from the international capital market. However, many argue that this may not be a problem if the two accounts are balanced, or even better if they are in surplus: the government budget and the international trade balance. This is partially true. Insolvency affects not only the government (country) that defaults but its private sector as well. International credits (loans) are required to finance both imports and exports. During the 2010-2012 period, many Greek exporters and importers found it extremely difficult to buy their imports without full prepayment, and were unable to sell their exports with some advanced payments. The response they were getting was what if Greece defaults? And this happened, only because there was, a threat of default. So international loans are needed to finance international trade even if the trade balance and the government budget are in surplus. Higher borrowing rates affect private investment as well. All of these result in lower growth rate and future loss of output.

¹¹ See, for example, the survey by Panizza et al (2009) and Sandleris (2012).

It is true that part of this cost will be paid by the next generations. Thus, from a political point of view, the current generation will shift the burden of the default to future generations, yet to be born. Still this might be an optimal policy, if the present value of the future debt liabilities are lower than the additional wealth created by the accumulation of debt. The problem is that default does not affect only the future borrowing costs but it has a detrimental impact on the value of accumulated wealth such as residential and non-residential property.

Summing up, the cost of a unilateral default cannot be estimated, because it depends on diverse and non-quantifiable variables such as reputation costs, political costs, international trade exclusion costs etc. The economic literature does not help either since it provides conflicting evidence. A recent paper by Ardagna and Caselli (2014) argued that if Greece had decided in 2010 to a "unilateral and disorderly default" the results would have been catastrophic for the Greek economy. Greece would have entered into a depression. According to them, the brutal fiscal retrenchment and the collapse of the banking and financial sector would trigger off such a devastating loss in output.

This is not a persuasive explanation because these effects are short run and when they are compared with the output loss of maintaining excessive debts over a long period of time, then default would always emerge as an optimal policy. After all Greece was able to produce an unprecedented fiscal consolidation in the first three years of its bailout program, by achieving a primary government surplus and a trade surplus.

Default would have been catastrophic to Greece because it would have undermined its long run productivity growth through a reduction in private investment. It can be considered a negative supply shock moving the long run equilibrium path to a much lower level. It would have had a permanent long run negative impact on economic growth. An exact estimation is not possible because it is difficult to account for (a) the length of the impact and (b) the magnitude of the negative output impact. However, in section 7 we come up with some estimates of the cost of unilateral default on the Greek sovereign debt. In the next section another unilateral action, that of self-imposed austerity measures, is discussed.

6. Unilaterally Imposed Austerity Measures

The current fiscal consolidation program agreed with the IMF, the Economic Commission and the European Central Bank was imposed to bailout Greece so that she would not default on its excessive debt. However, the same fiscal retrenchment policies could have been applied without the need of external assistance. But would such self-imposed austerity measures have been politically possible? The answer is, No!. Austerity measures and structural changes cannot be made with the existing Greek institution unless there is pressure from outside. This assumes that Greece would still want to be a member of the eurozone because it can always opt to leave the eurozone and introduce its own national currency. It seems that the majority of Greeks do not want to leave the eurozone and this is the reason why they vote for political parties which are committed to the euro and of course to the European Union.

Apart from the political difficulties, unilaterally imposed austerity measures to create the necessary budget surpluses could have worked, but this option could only work if it was implemented early on and no later than the beginning of 2009. In December 2008, politicians inside the Greek parliament were warning that Greece was heading towards bankruptcy and that the IMF was waiting at the gate, so to speak. In 2008, the accumulated debt increased from 107% of GDP to 113% (see Table 1 above). In 2009 it soared to 130% and in 2010 to 148%. By the end of 2009 and the beginning of 2010 with the "help" of the

Greek Prime Minister at the time, Greece was portrayed in the international media as a country heading for default. The austerity measures could have been applied by the end of 2008 and implemented at the beginning of 2009, which as things turned out would have in any case been impossible, because early elections were called.

I have examined elsewhere that the accumulation of public debts in the 21st century was the result of the increase in public wages, see Papanikos (2014a). As I explain in the book (chapter 5), in 1999 the public debt was 161 billion euro measured in constant 2013 euro or 95% of GDP. In 2010, sovereign debt doubled and reached 322 billion euro or 148% of GDP. Where did these extra 161 billion euro go? I have shown that 92 billion was spent on interest of the Greek debt inherited from the 20th century. The average interest rate to serve this debt was 5.2%. Thus we are left with outstanding 69 billion euro, which needs to be explained. During this period, wages in the Greek public sector and public enterprises increased at unprecedented rates topping all the eurozone countries. The cost of the excess public wages is reproduced from my book as Table 3 here. The total cost amounts to 80 billion euro, 64 billion euro was used to pay the higher salaries and 17 billion to pay the debt for these increases. Thus, the additional debt of 69 billion euro was spent on public wages. If real public wages did not increase, Greece would have created an accumulated budget surplus of 80 billion euro to pay back almost half of the debt of the 20th century.

Table 3 Budget Cost of Excessive Increases in Public Wages and the Interest to Serve Them, 2000-2010

Year	Excess Public Wage Cost (millions of euro)	Cumulated Interest on Debt to Finance Excess Public Wage Increases (millions of euro)
2000	1350	742
2001	1511	755
2002	5354	2409
2003	6811	2724
2004	7507	2627
2005	6975	2092
2006	6534	1633
2007	7517	1503
2008	7202	1080
2009	8504	850
2010	4467	223
Total	63730	16642

Source: Papanikos (2014a, p. 40).

This would have been impossible because the beneficiaries were the employees of the Greek public administration and public enterprises. They held tremendous political power and they are considered as part of the privileged classes of Greece. A unilateral fiscal consolidation would have required an agreement with the two trade unions that represent the workers in the public sector (ADEDY) and the public enterprises sector (GSEE). This was impossible then and it is impossible now.

The collapse of PASOK and the rise of SYRIZA is primarily due to the fact that SYRIZA promises them that their higher salaries and other privileges will be restored to the pre-crisis period. However, the only way they can achieve this is if they leave the eurozone and start printing inflationary national currency. Currently, this option does not have strong political

support. Thus, the Greek political authorities were left only with two options. Either to unilaterally default or negotiate the restructuring of the debt. Since 2010, the Greek governments have decided to negotiate the terms of debt bailout. This option is discussed in the next section.

7. Debt Restructuring through Negotiations

This section discusses issues that relate to debt restructuring through voluntary negotiations. In other words, debt restructuring is a bilateral agreement between the debtor country and its creditors. The negotiations can become multilateral if two or more debtor countries negotiate with one, or a group of creditors. This could have been the case of the eurozone countries. Arellano and Bai (2014) have developed a theoretical model to explain the optimality conditions in such multilateral negotiations. Malloy (2012) also examines debt negotiations and concluded that there was very little multilateral response to the current debt crisis. The purpose of negotiations is to avoid default and it should be distinguished from negotiations that follow a unilateral default. Debt restructuring is not a default and usually involves all sorts of negotiations¹².

Sturzenegger and Zettelmeyer (2008) have examined the haircuts negotiations of Russia, Ukraine, Pakistan, Ecuador, Argentina, and Uruguay in the 1998-2005 period. Hatchondo et al (2014) examine, within a theoretical framework, voluntary debt restructurings which are beneficial for both the debtor and the creditors through a decline in the risk of default. Yue (2010) develops a model for a small open economy to examine debt renegotiation which is used to replicate the dynamics of Argentina's debt.

For the purposes of this paper, debt restructuring negotiations involve three things: the level (percent) of haircut, the level of the interest to be paid on the rest of the debt and the maturity of the debt. It is assumed that the three variables are monotonically related in the sense that higher haircuts and short maturities imply higher interest rate with the remainder of the debt. They also imply additional costs for the private sector to borrow as was demonstrated by Arteta and Hale (2008).

Table 4 reports a scheme of debt restructuring in terms of the three variables. The total Greek debt to be negotiated is 300 billion euro. The haircut is assumed to be 120 billion euro, an amount that will bring the debt to GDP rate below 100%. The last row is the case of a default, i.e. a unilateral haircut of 300 billion euro. Two debt maturity periods are examined: 30 and 50 years. In all cases, a change in the parameters of the scenarios does not change the nature of the most important conclusion: a reasonable interest rate (borrowing cost) may result in the same economic impact for all options. Such possible interest (borrowing) rates are reported in Column 3 of Table 4. In present value terms, all four options have the same economic impact of 388 billion euro.

¹² Actually Enderlein et al (2012, p. 250) have argued that "... default versus non-default is overly simplistic, as it ignores the large variation in crisis resolution policies and related negotiation patterns".

Table 4 Debt Restructuring Scenarios

Debt	Haircut	Interest Rate	Maturity Years	Total Interest Payments	Annual Pays	Private Sector Borrowing	Borrowing Rate of the Private Sector	Total Private Borrowing Cost	Annual Pays	Total Cost	Annual Pays
300	0	1.08%	50	388	7.76	200	3.08%	392	8	780	16
300	120	3.60%	50	388	7.76	200	5.60%	596	12	984	20
300	0	1.80%	30	388	13	200	3.80%	334	11	722	24
300	120	6.00%	30	388	13	200	8.00%	528	17.6	916	31
300	300		30	0	0	200	20%	1203	40	1203	40

The example of Table 4 does have a significant impact on the intergenerational distribution of debt burden. Debt maturity of 50 years has a greater impact on future generations than a debt maturity of 30 years. The annual payments of the 50 years maturity is 7.76 billion of euro but almost double for debt maturity of 30 years. In general, the shorter the debt maturity the lower the debt burden for future generations. Households with children may be indifferent but childless households are better off, if their bequests are less than their per capita debt burden. From a political point of view, longer maturities seem preferable, because the youth and the unborn generations do not vote. It would be fairer if a voting system gave more votes to individuals with children who do not vote. In this way, the youth's interests will be represented in the policy decision making.

Haircuts create political problems too for the other countries of the eurozone which hold the Greek debt. It does not sell well to say to their citizens that we are cutting the Greek debt; it looks better if the negotiations involve only the interest rate. As can be seen from Table 4, the economic impact could be the same with or without haircut. Actually, it is easy to design debt restructuring with zero haircut but with lower interest rates which benefits Greece or have higher haircuts where the economic impact for Greece is higher and benefit the creditors.

The last row gives the unilateral default. In this case, Greece pays nothing. Too good to be true even if one assumes that Greece would never need to borrow again from the international capital markets. Public debt affects the private borrowing rate and a default will skyrocket these costs. Only the threat of a default increases the rates to double digit figures and once they start rising, they never stop. In Table 5, it is assumed that after a default, the borrowing rate of the private sector is 20%, if the private sector can borrow at all. If one takes into consideration that the private borrowing rate is at least 2 percentage points higher than the sovereign borrowing rate and whenever there is a rumor about a Greek default, the sovereign rates reach high double digit rates in a couple of days, if not in hours.

Currently, according to the World Bank data, the private debt of Greece is 122% of GDP, more than 200 billion euro used in Table 4. Even if we assume that the government would require zero future loans, the cost to private borrowing renders the option of default very costly and will be chosen only if the other options are not available. If the private and public costs of future borrowings are considered, Table 4 shows that haircuts give rise to higher total borrowing costs for the private sector. From the other two options, the shorter maturity without any haircut gives the lowest economic impact. However, one could design an interest rate structure which results in the same economic impact for all four alternatives in terms of the overall borrowing cost.

Based on the above example, we are able to give an answer to the question whether there are any real alternatives in dealing with Greek Debt? The answer is not really. This section has shown that under certain conditions all four options could be indifferent if only their economic impacts are taken into consideration. The issue becomes a political one at both the national level and at the eurozone countries' level. Haircuts are politically appealing in Greece but would most probably be met with strong reactions from the taxpayers of the other countries of the eurozone. It goes without saying, that long maturities are politically more acceptable to the current generation of Greece, particularly to childless households. But, what about the distribution of the tax burden between the social classes of the current Greek generation? This question is answered in the next section. According to IMF (2014), there is some evidence that the current austerity measures have improved the income distribution of Greece. The rich were hit harder but more could have been done. How it could have been done is discussed in the next section.

8. A Tax on Wealth to Pay for the Greek Debt

Greece is a rich country with high official per capita income and much higher income, if the informal economy is taken into consideration. For the first time in the long Greek history, per capita income has been constantly increasing in the last 60 years. Because of these high incomes, the Greek households were able to accumulate a historical unprecedented stock of physical (money) wealth, part of which was the result of the accumulated huge public debt. Concurrently, the accumulation of Greek human capital might have been greater than the accumulation of material wealth. To top that, Greece has untapped natural resources, including its natural, cultural, and historical sites which makes it an attractive tourist destination. In addition, the Greek merchant fleet is one of the top in the world, if not number one. The value of Greece's total wealth should be some trillions of euro. With all of this in mind, how can this country default, you may ask.

This wealth can be used to pay the Greek public debt without seriously undermining the living standards of Greek households, especially the poor and the non-privileged. Actually, if a tax on wealth is imposed, the poor Greek households would become better off¹³. Despite the current economic crisis, the lowest Greek per capita income of the 21st century of 16,834 in 2013 is larger than the highest per capita income of the entire 20th century of 16,781 in 1999. Both are measured in constant 2010 euro. Thus, if there is a humanitarian crisis similar to the occupation years during the second world war as some of the press reports, then this must be the result of the deterioration of income distribution and not because of lower GDP. However, data on income distribution show it has improved during the crisis year. Why then is there so much noise on what has been called "a modern Greek tragedy"? Even in the current Greek political debate a comparison is made with Argentina. Some argue that Greece should follow Argentina's example because presumably it is better off. According to per capita income, Greece ranks at the top of the 25% richest countries in the world. The per capita GDP difference with Argentina is about 4000 euro without taking into consideration the notorious Greek informal sector that adds at least 25% more to this difference. Greece's GDP must be reduced by close to 50 billion euro if it is to be equated with Argentina's GDP. This GDP difference corresponds to about 300-350 billion euro of wealth, enough to wipe out the entire current public debt. But this requires a tax on wealth.

¹³ This, because the value added tax has been used to pay the debt; a tax that hurts the poor households more than the rich households. From a Greek political point of view, protecting the rich is more convenient than protecting the poor. Compare the reaction of all Greek political parties to the property tax with the reaction to value added tax. The property tax hurts the wealthy and is the reason why it was met with such strong opposition.

A fixed amount of tax is proposed to be paid proportionally by wealth owners. It includes a tax on private property, private bank deposits and other wealth items such as shares, luxury cars, boats, jewellery etc. This tax can be spread over a period of five or more years to take into consideration the short run liquidity constraints of rich households along the lines suggested by Bach et al (2011). There will be no tax on non-private wealth and no tax on business. Only individuals who own these businesses will be taxed. Taxing wealth has been debated in Europe and in the USA. In the U.K., a tax on wealth was part of the 1974 successful electoral campaign of the labour party but it was never implemented. A historical account is given by Glennerster (2012). Lavoie (2014) proposed a wealth tax in the USA. As he states "The goal is not to "soak the rich" but to protect society from an overconcentration of them. The idea is to ultimately expand the ranks of the very wealthy so that the group becomes more fluid, and potentially obtainable, to all citizens. In broad outline, this article proposes a yearly graduated tax on the net wealth of all individuals in excess of \$100 million. The rate would be 5% on the excess up to \$500 million and then 10% thereafter. Within the 10% bracket alone such a tax would only impact approximately [20,000] households, but would raise in excess of [\$300] billion in revenue".

The theoretical arguments against and in favour of a tax on wealth have also been debated for long in the economics literature. Its effect on efficiency, savings and future investment are some of the issues discussed¹⁴. At the theoretical textbook level, many good textbooks exist that discuss the construction of an optimal tax system, both in terms of efficiency and fairness. The most important conclusion of this vast literature is that there is no unique tax system that can be applied to all countries. The optimality of the tax system in meeting the objectives of efficiency and fairness depends very much upon the specific country's characteristics. An important such characteristic is tax evasion which is ubiquitous in Greece. In this context, Brunner et al's (2010) paper is relevant because they develop a model where optimal taxation includes a tax on wealth when tax evasion is of non-secondary importance. And for this reason a wealth tax is appropriate for Greece, not only to pay for the debt, but to become a permanent part of the Greek tax system as I have explained in detail in Papanikos (2014a). A lump sum tax on wealth (a tax on the rich) to pay the debt is considered as the best option for Greece because:

1. Those who have benefited the most from the accumulation of excessive debts are called upon to pay for the debt.
2. It is progressive and fair because everybody pays according to his/her ability.
3. It mitigates previous tax injustices because a large part of the accumulated wealth has been the result of non-reported income to tax revenue authorities. Greece has many rich people according to their wealth but according to their reported income to tax authorities they are supposedly poor. Tax evasion exists in all countries, but in Greece it has become an epidemic disease.
4. It has a very low administration cost of collecting the tax because it can avoid all together the infamous Greek tax revenue authorities, notorious for their inefficiency, ineffectiveness and above all their corruption.
5. A lump sum tax on wealth and the wealthy has the least distributional impact and the least impact on effective aggregate demand.
6. It has however the strongest political opposition from all parties including the radical left and even the communists who on principle are against private property ownership and of course, private wealth.

¹⁴ See among many others the recent contribution by Auerbach (2013).

The purpose is to reduce debt below 100% of GDP in five years. This amounts to about 150 billion euro or 30 billion euro per year. Table 5 provides a tax on wealth scheme. It uses the GDP of 2013 as the base which was the lowest of the entire period. The GDP of 2013 was 182 billion. It does not include the output produced in the informal economy which according to conservative estimates is about 25% of the total output. If this added, then the total Greek GDP is close to 250 billion euro.

The starting point is the totals which are the actual data. The number of Greek households is 4 million and the total population 11 million people. Total output is 182 billion euro and current government consumption is 36 billion euro. The difference of 146 billion euro is the total income of Table 3. Assuming that wealth is 7 times higher than income, private Greek wealth exceeds one trillion euro. The average tax wealth is 3%, and the maximum 5%.

Five income classes are considered with a different average income from 8,000 euro to 400,000 euro. I have discussed in detail these social classes in Papanikos (2014a and 2014b). The wealth tax is progressive and is set out in such a way as to collect the fixed amount of 30 billion euro a year. Notice that the average income excludes other taxes paid for government consumption. In five years, the Greek debt to GDP ratio will be reduced below 100%, a ratio which has a positive impact on economic growth.

The tax burden as a percentage of income is also bearable if one takes into consideration that some of the rich and privileged classes of Greece pay no income tax either because of tax evasion or tax avoidance. The richest households with an average annual income of 400 thousand euro, will have 35% of that amount taxed as tax on their wealth. Similarly, the second richest households with an average income of 76 thousand euro will pay 28% of that income as tax on their wealth.

Table 5 Taxing Wealth to Pay for the Greek Debt

Class	Households ¹ (millions)	Average Annual Income ² (euro)	Total Income ³ (billions of euro)	Wealth ⁴ (billions of euro)	Wealth Tax Rate ⁵	Total Wealth Tax Revenue (billions of euro)	Average Wealth Tax per Household (euro)	Total Wealth Tax as % of Income
1	1.15	8000	9.2	64	0.001	0.0644	56	0.007
2	1.2	20000	24	168	0.01	1.68	1400	0.07
3	0.8	40000	32	224	0.02	4.48	5600	0.14
4	0.8	76000	61	426	0.04	17.02	21280	0.28
5	0.05	400000	20	140	0.05	7.00	140000	0.35
Total	4.00		146	1022	0.030	30		0.21

Notes:

¹My estimates. The total number of households are census data.

²My estimates. It takes into account that the weighted sum of all incomes should add up to total Greek GDP of 2013 minus the final government consumption.

³It adds to total nominal Greek GDP of 2013.

⁴Piketty and Zucman (2013) report that wealth is 6-7 times higher than income. Here it is assumed 7 times higher to take account the underground economy.

⁵Lavoie (2014) suggested a progressive wealth tax rate for USA that starts at 5% and reaches 10%. Bach et al (2011) proposed a similar tax for Germany from 3.4% to 5.3%.

The above numbers are indicative, but reality should not be far away. In any case, differences would not affect the main idea: the wealthy should pay for the public debt. The current arrangement of debt management hurts more than it should the 1.15 million Greek households that belong to the poorest Greek class. Unfortunately, they are politically weak

and cannot displace the richer and the privileged Greek social classes. All political parties of Greece are against property taxes which is part of what is here defined as a wealth tax.

9. Conclusions

Greece has high income and has accumulated massive wealth, unprecedented in its long history. This was the result of a long period of prosperity and peace after World War II. Today, Greece ranks in the top world quintile in terms of its per capita income and much higher if its untapped physical, natural and human wealth is taken into consideration.

This income and wealth can be used to pay in total, and with the proper interest, all of Greece's debt in a very short period of time and in any case in less than ten years. Consequently, if Greece unilaterally defaults on its debt, this will be the result of its unwillingness to pay rather than its inability to pay. This is the reason that the current debate on Greece's debt has become a political one and not an economic one. The options to deal with the Greek debt affect (a) the future Greek generations and (b) the non-privileged Greek classes. The first have no direct political power in today's policy decisions on how to pay the public debt and the second does have direct political power but it is relatively weak.

This study uses an example to demonstrate that with plausible (realistic) assumptions about borrowing rates, debt maturities and haircuts, all options result in the same economic impacts. In economic terms, there are no real alternatives. However, political impacts are not the same. Debt restructuring requires the political concession of the taxpayers of the eurozone countries which are the major holders of Greek debt. Haircuts are associated with strong political resistance from the other countries even though under realistic interest rates and debt maturity schemes, debt forgiveness (haircuts) may be a better economic option for their taxpayers.

On the other hand, opposition political parties in Greece demand partial or full haircuts, even though under very realistic assumptions about future borrowing rates and maturities, the economic costs of such options are higher compared with options of full debt payment. The reason is political. Haircuts benefit the current Greek generation and harm the young and the unborn generations. They also hurt the non-privileged social classes due to the unfairness of the Greek tax system such as the value added tax and the extent of tax evasion of the privileged classes. The latter have accumulated huge wealth without paying their dues in the form of income tax.

This study proposes a tax on wealth. It is progressive and equitable. It also corrects past injustices of the tax system. The privileged classes, who accumulated wealth by tax evasion due to non-reported income, will pay their fair share of tax. This tax can reduce the Greek debt below 100% of GDP in five years without undermining the living standards of the non-privileged Greek households and has a minimum possible effect on aggregate economic activity.

Summing up, all options dealing with the debt overhang can be designed in such a way that they end up with the same economic impacts. They differ though in political support. It seems that all Greek political parties propose measures which favor the current generation at the harm of future generations. And they benefit the privileged classes at the harm of poor households and other non privileged classes. Unfortunately, even the left Greek political parties do not support the tax on wealthy Greeks as has been demonstrated by the fierce political resistance to the introduction of a tax on private property compared to the resistance to the huge increase in the value added tax.

The tax on wealth harms the rich and the privileged social classes. The value added tax harms the poor and the non privileged classes. The rich and the privileged classes in Greece have stronger political power than the poor and non privileged. This has been equally true for both the conservative and radical political parties. The current political debate between the New Democratic Party and the SYRIZA is not about options to cope with the debt but who can negotiate better these options. Both represent the political interests of the rich and the privileged classes of Greece. As I have explained in detail elsewhere, Papanikos (2014a), the non privileged classes include all those who have been harmed by the parasitic role of the privileged classes, primarily the vigorous and non state nourished Greek entrepreneurial class. Unfortunately, unlike their counterparts of state nourished Greek entrepreneurs, the non privileged entrepreneurs have weak political power.

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