

Is the Greek debt sustainable? Analyzing three different scenarios for the forthcoming period 2018-2022¹

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Abstract: In this paper we attempt to estimate the development of the Greek public debt for the period 2018-2022. In order to achieve this, we analyse three different fiscal scenarios that are based on the official data available, together with our estimations that are based on a specific conceptual framework which we develop. The three scenarios are based on a different mixture of GDP growth rates and budgetary surpluses of GDP. The analysis concludes that the numerical outcome is almost the same in all three case scenarios. However, the third scenario is the best since it leads to higher growth, GDP and less austerity measures, thus making public debt sustainable in the long run. The third scenario also provides the best combination of the trade-off between austerity and growth. We conclude by discussing some policy measures.

Keywords: Greek Public debt, debt development, three fiscal and growth policy scenarios

JEL Classification: H21 · H50 · H62 · H63 · P16

1. Introduction

The discussion regarding the sustainability of Greece's public debt is ongoing. Greece has signed up till now three memoranda (with a forth probably forthcoming), with the third ending in 2018. Although finances have been restructured and some structural changes have been implemented, Greece is the only EU country (after Ireland, Portugal and Cyprus) which is still under memoranda and which will still depend for some years to come on EU-ECB-ESM-IMF financial support. Thus, the issue of the sustainability of Greece's public debt is an open question.

¹ A first draft of this paper was presented at the European Economic Order Conference of the KAS Postgraduate Research Group Social Market Economy in Cooperation with Konrad-Adenauer-Stiftung Greek Office, on November 18-20 2016 in Athens.

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The paper is organised as follows: In Section 2 we analyse in brief how the Greek debt crisis evolved before and during the 2010-2017 economic crisis by highlighting certain critical points that resulted in the low positive effect of the three Memoranda bailout packages (MoU's) on the Greek economy in terms of economic restructuring and economic recovery and growth. Section 3 analyses the structural and institutional inefficiencies of the Greek economy by focusing on the basic findings of *The Economic Freedom Indicators* as given by the Fraser Institute and the Heritage Foundation. Section 4 focuses on our main argumentation, the analysis of three alternative scenarios concerning the development of the Greek public debt during the 2018-2022 period.

The three scenarios are based on a different mixture of GDP growth rates and budgetary surpluses to GDP that we analyse separately for each of the three scenarios. For the first scenario we assume GDP growth rates of as high as 2,5% and budgetary surplus equal to 3,5% of GDP, for the second scenario we assume growth rates as high as 3,0% and a budgetary surplus of 2,5% of GDP, and for the third scenario we assume growth rates of as high as 3,5% and a budgetary surplus of 1,5% of GDP. The main hypothesis in the three scenarios is that there is a trade-off between surpluses and growth. Higher surpluses necessitate more austerity measures (higher taxes, cuts in expenditure, growth, while lower surpluses are growth promoting).

This is linked to past experience of the memoranda. Up to now, austerity measures have resulted in a seven-year period of recession, with a cumulative loss of 25% of GDP, a current rate of 25% unemployment and a drop of more than 40% in available income. Furthermore, IMF forecasts as to growth proved wrong, recession was much deeper and long lasting, due to a wrong specification of the final (negative multiplier). This led the director of the IMF Mrs. Christine Lagarde and the chief economist, O. Blanchard, to apologise publicly for their mistake.

Finally, in Section 5 we offer a comparison and commentary as to the results concerning the three scenarios, while in Section 6 the analysis concludes with some policy proposals.

2. The development of public debt and the wrong administrative policies of the Greek governments during the 2010-2017 period, in brief.

In this section, we raise some issues as to why the Greek economy failed to achieve better macroeconomic outcomes during the 2010-2017 economic period. This is

important so as to make a cautious and reliable overall report of the Greek economy and to detect the mistakes and inconsistencies that occurred, so as to provide the most suitable institutional instruments towards better macroeconomic outcomes in the near future. What is imperative is that the Greek economy must achieve a stable period of growth rates and public surpluses so as to gradually shorten the exorbitant level of the Public Debt (183,9% of the GDP for 2016).

Till early 80's Greece's Public Debt was approximately 22% of GDP and thus very low (Fotopoulos, 1992; Nelson, Belkin and Derek 2011; Alogoskoufis 2013; Kalyvas, 2015; Nikiforos, Papadimitriou, and Zezza, 2016). However, then, Greek politicians of both main parties, which alternated in heading the government tried to satisfy the demands of their political clients by increasing wages and salaries and increasing employment in the public sector, by introducing relatively high minimum wages in the private sector.

During the period 1980-2010 political parties tried to satisfy the demands of their political clients: i) by increasing wages in both the private and the public sectors and by performing excessive appointments of civil servants in the public sector (characterized by very poor efficiency), ii) by the excessive rise in taxation of private companies, iii) by parasitic trade union actions that were linked to opportunistic behaviour by their leaders (many strikes, etc.). At the same time, iv) there was strong competition from some industrial giants from other EEC countries. Thus, (due to ii and iii), the Greek industrial base was under a process of gradual disorganization which led to a loss of competitiveness, and, v) many high-ranking political officials were involved in corruption scandals, insofar as public sector procurement was concerned. Furthermore, vi) a large portion of Greeks gradually started to adopt a corruptive mentality of excessive and irrational consumption instead of investing and saving. But even more crucial, vii) by not aggressively pushing tax collection or implementing tax reforms, etc. a black economy was allowed to thrive (estimated at about 30-40% of official GDP).

Greece's membership in the EMU and the adoption of the euro lowered interest rates and inflation compared to previous periods. Inflation in the 1990's had reached, in some years, over 20%, and interest rates on deposits, 18%. Instead of seeing this as an investment opportunity, both the public and private sectors perceived low interest rates as a consumption bonanza. The public sector borrowed in order to satisfy higher

spending (increases in public employer's salaries, waste etc.) and the private sector for extravagant consumption (banks gave loans even for holidays).

Before the crash of the Greek economy in 2010, the Greek statistical service "cooked" public deficit and debt statistics and, surprisingly, the European Statistical Office accepted them as correct. In 2010, the newly-elected PASOK socialist government discovered that the actual situation was different. The public deficit, as stated by the previous government as being about 3-4% of GDP, was actually about 14%. The situation was out of control and the government had to ask the EMU for financial help. It was a totally unforeseen situation and the EMU had no instrument to face a debt crisis of one of its members.²

Invoking also a lack of expertise in facing debt crises, the EMU asked for assistance from the expert, the IMF, to draft a program for the financial bailout of Greece together with the necessary reforms. This was the first memorandum agreement, followed within two years by a second one. In total, the EMU member states and the IMF lent Greece 250 billion euros, the biggest financial assistance package in history to a country of just 11 million people and with a GDP in 2010 of 220 billion euros.

In 2012, a "haircut" of 55% of the Greek debt that was imposed on the private sector (Private Sector Involvement, PSI) was implemented. Greece was followed by memoranda in other states such as Portugal, (in a situation somewhat similar to that in Greece) Ireland (banking-sector-induced, following the toxic products crash in the USA in 2008) and Cyprus (banking-sector-induced, due to the exposure of its banks to Greek bonds). Ireland managed to emerge from its memorandum in 2014 and achieved high growth rates and falling unemployment. Furthermore, the situation in Portugal and Cyprus after their exit from the memoranda is improving. After 7 years under the memoranda, the situation in Greece is deteriorating and verging on collapse.

Greece's problem was twofold: excessive public debt and a trade balance deficit, due to the lack of competitiveness of the Greek economy. As stated earlier, public debt was due to a bloated public sector because of relationships between political parties and governments and their clients. Thus, the memoranda provided for measures to decrease

²This is also astonishing in view of the fact that such mechanisms existed in the EMU's predecessor, the European Monetary System, and some countries, such as Italy, did employ them. It was thought that if countries followed the two financial criteria (public deficit less than 3% of GDP and public debt less than 60%) a debt crisis could never arise, making such mechanisms superfluous.

the size of the public sector (one new employee was to be hired for every five retiring) plus additional firing of employees, closure of non-performing and unnecessary public organisations³, corporations, etc. streamlining the public sector (for example, uniting numerous pension funds into fewer to obtain economies of scale) and reduction of salaries. Parallel to the reduction of expenditures, the programs foresaw revenue increases through increases in taxation (VAT, income and corporate tax and from 2012, a tax on property and houses) and an extensive program of privatization of state property (Kyriazis and Economou 2016).

Then, a third bailout agreement was signed in July 2015 between the Greek government, the European Union (EU) and the International Monetary Fund (IMF) as a consequence of further financial assistance that was necessary for Greece in order to avoid bankruptcy. According to this third MoU in 5 years Greece would receive a loan of up to 86 billion euros to be given from 2015 until June 2018. In return, Greece would have to streamline the VAT system and broaden the tax base to increase revenue, reform the pension system, safeguard the full legal independence of the Greek Statistical Office (ELSTAT), automatically cut public spending to get primary surpluses, reform justice in order to accelerate the judicial process and reduce costs and implement all the OECD requirements.

3. The structural institutional inefficiencies of the Greek economy: The Economic Freedom Indicators overview

As of the present the Greek government has not been able to efficiently handle fulfilling the above criteria. For example, Greece's bureaucratic and political record concerning privatizations and private investment is dismal, as the following examples show: The investment project to reallocate the old Athens Hellenicon airport to other uses (hotel, park, villas, marina) together with the TAP (Trans-Adriatic) Pipeline, etc., 915 million euros) to bring Azerian gas through Turkey, Greece and the Adriatic to Italy and Central Europe, the two biggest investment projects, have been delayed because of the Forestry

³ A notorious case was "Agrogi", a public enterprise that employed 285 employees, had an annual contribution per employee of about EUR 300 (an all-time labour productivity record!) and created an annual deficit of EUR 25 million, covered by the state's budget. It took four years to close it down.

Director of Piraeus, who has not yet given the necessary permit, although the contract for the project was signed three years ago and was approved by Parliament in 2016.

Privatization of DESFA (Greece's gas company, a MoU obligation) was cancelled due to the unilateral change of the contracts terms by the Energy and Environment Minister in 2016. The contract of the gas company was won by SOCAR three years ago, for 386 Mio euro). SOCAR withdrew its interest and the Ambassador of Azerbaijan in Greece declared that his government would not participate in the future new public offer for DESFA. The Minister of Merchant Marine and Harbours tried to alter the terms of the contract for the privatization of the second part of the Piraeus harbor with the Chinese company COSCO in July 2016 but was dismissed from government after strong protests by the Chinese Ambassador on behalf of his government.

The privatization of Asteras Vouliagmenis, a large tourist resort near Athens, has been delayed due to recourse to the courts for environmental reasons, and the same has happened (no court decision yet at the time of writing) with a big development project on Crete, belonging to the Toplou monastery. Investment projects by the Emir of Qatar, al Thani, (father of the actual reigning monarch) in the Ionian Islands have been held up also, pending court decisions because the use of land is not clear. The Afantou golf course in Rhodes has been delayed because, after the signing of the privatization contract, the Archaeological Directorate of the island discovered some ancient remains. For example, revenue from privatization in 2016 amounted to 500 million euro, as against a target of 1,3 billion, a shortfall of about 70%. These are only some examples as to why we estimate that growth rates and public revenue from privatizations will be lower than the forecasts.⁴

It seems that Greek bureaucracy and some ministers ignore the well-known Latin dictum *Pacta servanda sunt* (eg., treaties, contracts, must be served, meaning fulfilled). Another serious criticism levied against Greece's Memoranda partners is that they have paid insufficient attention to the bureaucratic-legal obstacles that inhibit investment in

⁴ Hopefully, some important privatization agreements have already been settled, such as the sale of 14 regional airports in the Aegean Sea to the German company FRAPORT and the sale of the Greek railway TRAINOSE S.A. to the Italian company Ferrovie Dello Stato Italiane S.p.A.

Greece, focusing on short term financial measures. But the improvement of the institutional framework including the “OECD’s toolkit” is what, together with lower tax rates on profit, would bring about higher growth rates and thus make debt sustainable. If we take the ranking of Greece according to the World Economic Freedom Indicators, which are annually published by the Heritage Foundation and the Fraser Institute, as an indicator of Greece’s attractiveness for FDI, we see Greece’s shortcomings. According to the *2017 Index of Economic Freedom*, and the *Economic Freedom of the World*, 2016, Greece ranks as the least attractive country not only among the EU and the Eurozone member states.

The Index of Economic Freedom (2017) which is published by the Heritage Foundation analyses countries by four main criteria, *rule of law*, *government size*, *regulatory efficiency* and *open markets*, each one further analysed in 12 sub-criteria. According to the overall evaluation, Greece is placed in the 127th position among 180 countries in economic freedoms with the total score 55,0 out of 100 and is characterised as “mostly unfree”.

Greece has a very low ranking in the *rule of law* ratio where it only scores 52,5/100 as a whole. In the *judicial effectiveness* sub-ratio it scores only 56,1 since the protection of property rights is not strongly enforced and the judiciary is independent, but the court system is extremely slow. The poorest score is related to *government integrity*, only 41.3/100. This is related to corruption, which remains a problem in Greece because, although tax enforcement has become more robust in recent years, authorities have largely failed to prosecute tax evasion by economic elites.

Concerning the *government size ratio*, the Greek economy scores 61,1/100 in the *tax burden* sub-ratio, 54/100 in government spending and 58,1/100 concerning *fiscal healthiness*. These numbers are justified since personal income tax rate has been increased to 42%, the corporate tax rate has been increased from 26% to 29 % and the overall tax burden equals 35.9% of total domestic income. Furthermore, government spending has amounted to 56.2% of total output (GDP) over the past three years, and budget deficits have averaged 3.7% of GDP. Public debt is very high.

Concerning the *regulatory efficiency* ratio, the Greek economy scores 74,3/100 in *business freedom*, because sporadic efforts to enhance the business environment have been undermined by red tape and insufficient political commitment. It scores 51/100, in *labour freedom* because labor regulations are restrictive, and the economy continues to lack labor mobility. It scores 78,2 in *monetary freedom*. This is related to the ongoing

Greek debt crisis which requires considerably more progress on planned privatizations of heavily subsidized and loss-making state-owned enterprises across a wide variety of economic sectors.

Finally, concerning the last criterion, the *open markets* ratio, it achieves 82/100 in trade freedom, since trade is important to Greece's economy and the value of exports and imports taken together equals 60% of GDP. It achieves 60% in investment freedom since foreign and domestic investors are generally treated equally, but bureaucratic barriers may discourage investment and only 40/100 in financial freedom since nonperforming loans are about 50% of total banking-sector loans, the second highest level in the euro area.

In order to exhibit the magnitude of the Greek macroeconomic problems, we indicatively refer to the second lowest EU economy's performance as far as Economic Freedoms are concerned, Slovenia, which ranks 97th out of 180 countries. As it has already been referred, Greece has the lowest ranking in economic freedom indicators (55,0/100) and holds the 127th position. The best performance throughout the EU countries is achieved by Estonia which ranks 6th (75,8/100), followed by Ireland ranking 9th (76,7/100), Luxembourg which ranks 14th (75,9/100), the Netherlands and Lithuania which both score 75,8/100.⁵ Germany, which is regarded as the "economic steam-engine of the EU finds itself in the 26th position (73,8/100). Hong Kong holds the 1st position, (88,6/100).

In the *Economic Freedom of the World, 2016 Annual Report*, of the Fraser Institute for 2016, Greece again has a very low ranking. It ranks 83rd out of 159 countries. In the *size of government* ratio it achieves 4,7/10, in the *legal system and property rights* ratio it achieves 5,9, in the sound money 9,7/10 (due to its participation in the Eurozone), in the *freedom to trade internationally* it achieves 7,9/10 and for *regulation* (open markets, labour and business market regulations) 6,4 (Gwartney, Lawson and Hall, 2016: 8,11, 85).

As a final comment till this point, we think that the above indicators describe quite well a series of characteristic inconsistencies of the Greek economy which have resulted

⁵ It is rather impressive that Estonia and Lithuania, two ex-Soviet countries, have managed to reconfigure their economic institutions so effectively as to manage to achieve the 2nd and the 3rd highest positions among the EU/Eurozone countries. The UK scores 76,4/100, ranking it 12th but it should no longer be regarded as an EU member following the Brexit decision on 23 June 2016.

in a long (and still ongoing) period (2010-17) of economic recession in the country. It appears that the “remedy” which, in the Greek case, were the three rounds of MoU’s bailout packages, proved incapable of prohibiting the further development of the economic crisis, in contrast to countries such as Ireland, which exited from its own bailout program at the end of 2013, and Cyprus, which exited from its bailout program in March 2016.⁶

4. The three alternative scenarios concerning the development of the Greek public debt during the 2018-2022 period

In this section we present three alternative scenarios regarding the development of Greece’s public debt for the period 2018-2022. The first is based on the following assumptions: a budget surplus of 3,5% of GDP each year, growth rates of 2,5%, interest rates on debt constant at 1% per year, and revenue from privatizations, 2 billion euro each year.

The budget surplus of 3,5% is the one agreed on under the Third Memorandum (MoU). In order to achieve this, additional measures have to be adopted as, for example, further tax increases (lowering of the tax exempt income which is for the public sector) cuts in pensions, etc.⁷ But these measures reduce available incomes, and thus demand, consumption and savings, and, at the end, growth rates. Therefore, we assume a growth rate of 2,5% per year over the period, which is lower than the optimistic ones of about 3,5-4% per year foreseen in the MoU for the period. We must also underline that up till

⁶ <https://www.theguardian.com/business/2013/dec/13/ireland-first-country-exit-eurozone-bailout>
<http://www.cnbc.com/2016/03/08/that-was-quick-cyprus-exits-bailout-with-cash-to-spare.html>

⁷ At the time of writing these measures were still under discussion. The tax-exempt income applies to public sector employees, pensioners etc. but not to the self-employed, who are taxed from the first euro earned! This is a particular of the Greek tax system which is contrary to the principle of equality. The argument in favour of this is that self-employed persons (lawyers, engineers, doctors etc) are presumed to be dishonest in their tax declarations, able to hide income, and thus not deserving of tax exemptions, like UK public sector employees who cannot hide their incomes. This again goes against the general principle of presumed innocence. The state presumes that all self-employed are guilty of tax evasion, because its administration has been unable to implement an efficient tax system that would be able to find out the real tax evaders.

now, all official predictions of the EU and IMF were widely off the mark, as stated before⁸.

In addition, we must not forget that while GDP fell cumulatively by 26% during 2009-2016 from its peak of 2008, available incomes fell, on average, by more than 40% due to very high tax increases and payments for pensions. The VAT was increased to 24% and tax rate on profits to 29% (35% for companies listed in the Athens Stock Exchange) compared to 10-12% for Cyprus, Bulgaria, Ireland. Furthermore, there was an introduction of high property taxes and also cuts in the expenses that can be deducted from income (for example medical expenses). Under the new law for insurance payments implemented in 2017, self-employed persons have to pay thrice the sums they paid up to 2016, which in addition to taxes, brings the total charge on their incomes to 90%! It is clear that such a situation is not sustainable, and will lead to the closure of many self-employed entities and an increase in black market transactions. This is why the government is accused of tax piracy. Already, during the first two months of 2016 100.000 self-employed have closed their business.

Further, we assume 2 billion euros per year from privatizations, which is used for the reduction of debt. We believe that this is a realistic assumption, being lower than optimistic official predictions. Over the past years, revenue from privatization never exceeded this sum, and the government's and bureaucracy's attitude, being as it is inimical to privatizations (MoU obligations notwithstanding), we believe that our assumption is realistic. Lastly, we assume that the alleviation measures of Greece's debt agreed to by the end of 2016, (but as yet withheld, because of the government's decision to give unilaterally about 600 Mio of an alleged 2016 budgetary surplus as a one-off gift to pensioners⁹) will lead to stable interest rates of 1%, as against today's variable rates of interest. Taking into account that Greece's outstanding debt in 2017 was 320 billion euros, interest payments per year for our forecasts period amount to 3,2 billion euros. Under these assumptions, we calculate GDP and debt development for our first scenario, given in Table 1.

⁸ <http://www.keeptalkinggreece.com/2016/04/11/imf-greeces-program-lagarde-admits-mistakes-in-fiscal-multipliers-no-consideration-of-human-factor-elections/>

⁹ We write "allegedly" because as IMF and EU remarked correctly, this surplus is spurious, because the government has not paid outstanding debts for materials and services given by the private sector (hospitals, health in general etc.), estimated at about 6 billion by the end of 2016.

In this table we estimate Greek GDP growth for the period 2018-22. In order to support such an analysis with reliable statistical data, we must first have gathered reliable information concerning the Greek GDP in absolute numbers for the recent 2015-17 period. According to the IMF's estimations and data base¹⁰ Greece's GDP for 2015 was 176,023 billion euros while Eurostat offers a slightly different estimation of 177,4 billion euros¹¹. For 2016, according to the IMF, Greece's GDP was 185,19 billion US dollars, or 175,44 billion euros. For the entire 2010-15 period of the crisis, the Greek economy suffered negative growth rates (except in 2014) while the European Central Bank (ECB) forecasted that Greece would achieve a low 0,1% growth rate for 2016. According to a recent estimation of the IMF (February 2017), the Greek economy will manage to achieve a growth rate as high as 2,7% for 2017 (IMF Country Report 2017: 40).

However, based on the above data, this estimation seems to be a very optimistic scenario due to the uncertainty of the Greek economy, since there is still open the issue of reaching a final agreement between the Greek government and the European institutions (Eurogroup and the ESM) on the one hand and between the Eurozone Lenders and the IMF in relation to the manipulation of the Greek debt crisis on the other hand¹². Till 2016, all the estimations of the IMF concerning Greece's growth rates and the multipliers associated with fiscal tightening have been overestimated.

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http://www.imf.org/external/pubs/ft/weo/2016/02/weodata/weorept.aspx?sy=2015&ey=2021&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=39&pr1.y=7&c=174&s=NGDP_R%2CNGDP_RPCH%2CNGDP%2CNGDPD%2CNGSD_NGDP%2CGGXWDG%2CGGXWDG_NGDP%2CNGDP_FY&grp=0&a=

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<http://ec.europa.eu/eurostat/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=teina225&language=en>

¹² Recently, IMF's director Christine Lagarde met with German Chancellor Angela Merkel to discuss Greece's debt crisis and ask for Greece's debt restructuring, something that Germany and other Eurozone lenders have categorically dismissed. <http://www.dw.com/en/imf-chief-lagarde-meets-merkel-over-greek-debt-forgiveness/a-37680579>. This is another aspect of how the IMF and the European Lender states approach the Greek crisis, which proves that there are different perceptions as to how the problem of Greece's macroeconomic consolidation must be solved. At the time of writing, Germany and the International Monetary Fund are moving closer to an agreement on the Greek bailout. On February 22 2017, after meeting with German Chancellor Angela Merkel in Berlin, IMF chief Christine Lagarde said

Table 1: Estimations of the development of the Greek public debt during the 2018-2022 period based on the First Scenario¹³

Year	2018	2019	2020	2021	2022
GDP (2,5% Growth rate)	177,2 + 177,2 · 2,5% = 181,6	181,6 + 181,6 + 2,5% = 186,1	186,1 + 186,1 · 2,5% = 190,7	190,7 + 190,7 · 2,5% = 195,5	195,5 + 195,5 · 2,5% = 200,4
Budgetary surplus (3,5% of GDP)	181,6 · 3,5% = 6,3	186,1 · 3,5% = 6,5	190,7 · 3,5% = 6,7	195,5 · 3,5% = 6,8	200,4 · 3,5% = 7,0
Interest payments	321,8 · 1% = 3,2	316,7 · 1% = 3,2	311,4 · 1% = 3,1	305,8 · 1% = 3,0	300,0 · 1% = 3,0
Privatisation revenues	2,0	2,0	2,0	2,0	2,0
Capital payment due to surplus	6,3 – 3,2 = 3,1	6,5 – 3,2 = 3,3	6,7 – 3,1 = 3,6	6,8 – 3,0 = 3,8	7,0 – 3,0 = 4,0
Total capital payments	3,1 + 2,0 = 5,1	3,3 + 2,0 = 5,3	3,6 + 2,0 = 5,6	3,8 + 2,0 = 5,8	4,0 + 2,0 = 6,0
Outstanding Public Debt (absolute numbers)	321,8 – 5,1 = 316,7	316,7 – 5,3 = 311,4	311,4 – 5,6 = 305,8	305,8 – 5,8 = 300,0	300,0 – 6,0 = 294,0
Debt / GDP ratio	316,7 / 181,6 = 174,4	311,4 / 186,1 = 167,3	305,8 / 190,7 = 160,3	300,2 / 195,5 = 153,5	294,0 / 200,4 = 146,7

Thus, there is no guarantee that the IMF's estimation will materialize in the end. For reasons such as excessive taxation that inhibits growth, we estimate that growth rates for 2017 won't exceed 1%. This means that Greece's GDP which was 175,44 billion euros in 2016 will not increase more than 1% in 2017, thus it will be as high as $175,4 + 175,44 \cdot 1\% = 177,2$ billion for 2017. This means that this figure is the starting point we adopt to perform the analysis that follows.

that Athens needs to focus on tax and pension reforms. Most notable, she said Greece does not need a debt write-down, but rather a debt restructuring. According to Lagarde, this could be discussed toward the end of the bailout program in mid-2018. See <https://www.stratfor.com/snapshots/greece-germany-imf-near-agreement-bailout>

¹³ The calculations that are applied here follow the first decimal digit after the comma methodology of estimation.

Table 1 estimates the evolution of the Greek GDP and needs a further explanation: Row 2 offers an estimation as to how the GDP will grow during the 2018-2022 period by assuming that the Greek economy achieves stable growth rates of 2,5%, instead of achieving 3,5% since we consider this prerequisite of the Third Memorandum as too optimistic to be true. Row 3 satisfies the prerequisite of budget surpluses of 3,5% of the GDP as agreed in the MoU. Thus, in row 2 the aggregate sum of each year's GDP increase is multiplied by 3,5% and by this, the annual budgetary surplus is estimated.

Row 4 calculates interest payments: it assumes constant interest payments of about 1% that the Greek government has to fulfill concerning its international lenders. Furthermore, we also hypothesize that the Greek public debt, which was 321,8 in 2016, (something that is verified by the IMF's estimation¹⁴), will not increase further in 2017, since the Greek government will manage to achieve a slight surplus budget for 2017, high enough to cover at least the interest payments to its international creditors, that is $321,8 \cdot 1\% = 3,218$. If this is the case, there will be no further public deficit to be added to the overall Greek aggregated debt for 2017. Thus, we estimate that the overall public debt for 2017 will not exceed 321,8 billion euros. This means again that the interest rate payments will be 3,2 billion euros for 2018 as well.

Thus we calculate it as constant 3,2 billion per year to facilitate the forecast. Actually, since we assume that each year's outstanding debt is being reduced due to payments, thus sum becomes slightly less over the years. On the other hand, if Greece returns to the open market and finances part of today's debt held by the official sector (IMF, EU, ESM, ECB) and by the private sector (substitution of OSI by PSI) then, presumably, Greece will have to pay higher interest rates which will again increase interest payments.

In row 5 we hypothesize that the Greek policymakers will manage to handle more efficiently the issue of earning revenues by privatisations for the entire period 2018-2022 and for reasons of ease, we estimate steady revenues as high as 2 billion euros. Row 6 presents the calculation of the sum which is the difference between budgetary surplus (row 3) and the interest payments (row 4). Row 7 presents the calculation of the sum of privatization revenue (row 5) and capital payments due to surplus (row 6). Row 8 calculates the previous year's debt minus capital repayments (row 8 minus row 7). That means that row 8 actually shows the calculation of each year's total Public Debt

¹⁴ Op. cit., note 4.

as it derives from the previous calculations. Finally row 9 shows the calculation of the total Public Debt in each year as a percentage of this year's GDP.

The results of this First Scenario show that with a growth rate of 1% for 2017 and stable growth rates 2,5% for the 5-year 2018-2022 period, Greece will manage to significantly reduce its debt from 183,4 in 2016 (according to the IMF estimation¹⁵). This will definitely be a real positive reconfiguration of the public debt macroeconomic ratio because it will further raise serious expectations concerning the viability of the Greek public debt for the next 2023-2030 period. Scenario 1 proves that if Greece manages to achieve sustainable growth rates for the period 2018-2022 and afterwards, the debt will further be reduced and some time (possibly till 2030) may reach the 125% level. This level is regarded as critical for an economy, in order to be characterized as “sustainable”, according to the European Commission’s interpretation¹⁶.

The critical point here is if, in reality, an economy in as serious a crisis as the Greek one during the 2010-2016 period, can manage to achieve stable growth rates for an extended period during 2018-2022 and later. In the concluding section we offer some proposals as to how this scenario could be achieved in practice.

We now turn to the second scenario, given in table 2, where we change two basic assumptions: First we assume a lower agreed budgetary surplus of 2,5% (instead of 3,5%) which seems more realistic and sustainable over the period, according also to the IMF. Second, we assume that this has a positive outcome on growth rates (less recessionary-restrictive-austerity measures necessary) which increase from 2,5% to a (a still conservative estimate) of 3%. By performing the required estimations based on the same methodology that it was used in Table 1 we reach a result, which reduces the ratio between the Public Debt and the GDP growth, to 147,7 in 2022, which is slightly higher than Scenario 1 (146,7).

Table 2: Estimations of the development of the Greek public debt during the 2018-2022 period based on the Second Scenario

Year	2018	2019	2020	2021	2022
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¹⁵ Op. cit. note 7.

¹⁶ https://ec.europa.eu/info/sites/info/files/ecfin_debt_sustainability_analysis_en.pdf
https://ec.europa.eu/info/sites/info/files/ecfin_presentation_4th_review_2nd_programme_brussels_en.pdf

GDP (3,0% Growth rate)	$177,2 + 177,2 \cdot 3,0\% = 182,5$	$182,5 + 182,5 \cdot 3,0\% = 188,0$	$188,0 + 188,0 \cdot 3,0\% = 193,6$	$193,6 + 193,6 \cdot 3,0\% = 199,4$	$199,4 + 199,4 \cdot 3,0\% = 205,4$
Budgetary surplus (2,5% of GDP)	$182,5 \cdot 2,5\% = 4,5$	$188,0 \cdot 2,5\% = 4,7$	$193,6 \cdot 2,5\% = 4,8$	$199,4 \cdot 2,5\% = 5,0$	$205,4 \cdot 2,5\% = 5,1$
Interest payments	$321,8 \cdot 1\% = 3,2$	$318,5 \cdot 1\% = 3,2$	$315,0 \cdot 1\% = 3,1$	$311,3 \cdot 1\% = 3,1$	$307,4 \cdot 1\% = 3,1$
Privatisation revenues	2,0	2,0	2,0	2,0	2,0
Capital payment due to surplus	$4,5 - 3,2 = 1,3$	$4,7 - 3,2 = 1,5$	$4,8 - 3,1 = 1,7$	$5,0 - 3,1 = 1,9$	$5,1 - 3,1 = 2,0$
Total capital payments	$1,3 + 2,0 = 3,3$	$1,5 + 2,0 = 3,5$	$1,7 + 2,0 = 3,7$	$1,9 + 2,0 = 3,9$	$2,0 + 2,0 = 4,0$
Outstanding Public Debt (absolute numbers)	$321,8 - 3,3 = 318,5$	$318,5 - 3,5 = 315,0$	$315,0 - 3,7 = 311,3$	$311,3 - 3,9 = 307,4$	$307,4 - 4,0 = 303,4$
Debt / GDP ratio	$318,5 / 182,5 = 174,5$	$315,0 / 188,0 = 167,5$	$311,3 / 193,6 = 160,8$	$307,4 / 199,4 = 154,1$	$303,4 / 205,4 = 147,8$

We finally proceed to the third debt reduction scenario, which we call “the IMF Scenario”, since we assume here a budgetary surplus of 1,5% over the period, which is what the IMF believes to be sustainable in the long run. We further assume, as before, a trade-off between surpluses and growth, so that in this scenario lower surpluses induce lower recessionary effects and thus higher growth rates of 3,5%. As we did also in the second scenario, we retain the assumption of privatization revenues of 2 billion euros per year and fixed interest rates of 1% and present the results in Table 3.

We must also remark that there seems to be a strong discrepancy between official statistics and information coming from the market in the recent past. For example, official estimate of growth for 2016 was about zero. Market information, on the other hand, showed that the revenue of Greek shops during the Christmas and New Year 2016 period was the worst since the beginning of the crisis, about 10% lower than in 2015, which was also a bad year due to the closure of the banks, capital controls and the overall uncertainties that the Greek referendum of July 2015 entailed, etc. Due to the uncertainty regarding the conclusion of the fourth evaluation of the Greek economy

which is being continuously postponed (from the end of December to January, from January to February and now, at the time of writing, to March), market investment projects are frozen, awaiting the outcome. This again leads many to forecast a bad outcome for GDP for the first three months of 2017.

Table 3: Estimations of the development of the Greek public debt during the 2018-2022 period based on the Third Scenario

Year	2018	2019	2020	2021	2022
GDP (3,5% Growth rate)	177,2 + $177,2 \cdot 3,5\%$ = 183,4	183,4 + $183,4 \cdot 3,5\%$ = 189,8	189,8 + 189,8 $\cdot 3,5\% = 196,4$	196,4 + 194,4 · $3,5\% = 203,3$	203,3 + 203,3 $\cdot 3,5\% =$ 210,4
Budgetary surplus (1,5% of GDP)	$183,4 \cdot 1,5\%$ = 2,7	$189,8 \cdot 1,5\%$ = 2,8	$196,4 \cdot 1,5\% =$ 2,9	$203,3 \cdot 1,5\% =$ 3,0	$210,4 \cdot 1,5\%$ = 3,1
Interest payments	$321,8 \cdot 1\% =$ 3,2	$320,3 \cdot 1\% =$ 3,2	$316,9 \cdot 1\% =$ 3,2	$315,2 \cdot 1\% =$ 3,1	$309,4 \cdot 1\% =$ 3,1
Privatisation revenues	2,0	2,0	2,0	2,0	2,0
Capital payment due to surplus	$2,7 - 3,2 =$ -0,5	$2,8 - 3,2 =$ -0,4	$2,9 - 3,2 =$ -0,3	$3,0 - 3,1 = -0,1$	$3,1 - 3,1 = 0,0$
Total capital payments	$-0,5 + 2,0 =$ 1,5	$-0,4 + 2,0 =$ 1,6	$-0,3 + 2,0 =$ 1,7	$-0,1 + 2,0 = 1,9$	$0,0 + 2,0 =$ 2,0
Outstanding Public Debt (absolute numbers)	$321,8 - 1,5 =$ 320,3	$320,3 - 1,6 =$ 318,7	$318,7 - 1,7 =$ 317,0	$317 - 1,9 =$ 315,1	$315,1 - 4,0 =$ 311,1
Debt / GDP ratio	$320,3 / 183,4$ = 174,6	$318,7 / 189,8 =$ 167,9	$317,0 / 196,4$ = 161,4	$315,1 / 203,3 =$ 155,0	$311,1 / 210,4$ = 147,9

5. Conclusions

We have presented above three scenarios with a different policy tax between budgetary surpluses and growth. Table 4 compares and interprets the outcomes of the three scenarios. All three scenarios end with almost the same Debt-GDP ratio, but different GDP's, the first scenario 200,4%, in the second 205,4% and 210,4% respectively. The

third scenario leads to 10 billion more GDP by the end of the period, with corresponding lower unemployment, thus it is the preferred one. This again means that less austerity (lower surpluses) do not endanger the sustainability of debt but make it more sustainable in the long run.

Table 4: Table 4: Comparing and interpreting the 3 scenarios outcomes

Year	2018	2019	2020	2021	2022
1st Scenario: GDP (2,5% Growth rate), Budgetary surplus (3,5% of GDP)					
Debt / GDP	316,7 / 181,6	311,4 / 186,1	305,8 / 190,7	300,2 / 195,5	294,0 / 200,4
ratio	= 174,4	= 167,3	= 160,3	= 153,5	= 146,7
2nd Scenario: GDP (3,0% Growth rate), Budgetary surplus (2,5% of GDP)					
Debt / GDP	318,5 / 182,5	315,0 / 188,0	311,3 / 193,6	307,4 / 199,4	303,4 / 205,4
ratio	= 174,5	= 167,5	= 160,1	= 154,1	= 147,7
3rd Scenario: GDP (3,5% Growth rate), Budgetary surplus (1,5% of GDP)					
Debt / GDP	320,3 / 183,4	318,7,0 /	317,0 / 196,4	315,1 / 203,3	311,1 / 210,4
ratio	= 174,5	189,8 = 167,9	= 161,4	= 155,0	= 147,9

Another failure of the memoranda programs till now has been their emphasis on short-term financial issues which, although necessary, do not address long-term problems. One, which threatens the future of the Greek economy (and pensions in particular) is demographic. After 2010 450.000 Greeks, mainly young and highly qualified people, have left Greece to find employment abroad. This equals almost 4% of the total population and 10% of the working population, and the reason being that unemployment among 20-30 year olds is about 50%. Further, the fertility rate, in order to keep population stable, is 2,1 children per woman. After 2010, this dropped in Greece to 1,3. If these two trends are not reversed soon, they represent a time bomb in the foundation of the Greek economy and society. The memoranda have nothing to say on this, no measures are provided to reverse the trend.

Other negative trends are the following: GDP has fallen from its peak of 242 billion in 2008 to its present of about 176 billion, middle class citizens from about 50% has been reduced to 25% (negative social mobility), share values in the Athens Stock Exchange have lost 90% of their 2008 high (destruction of property), “red loans” (loans which are not serviced and are in arrears have reached 106 billion (which is as high as

60,5% of the 2016's GDP), available incomes have fallen by 57 billion (due to GDP reduction and higher taxation), wealth has fallen by 587 billion representing a net loss of 67,7 euro per family, housing has lost almost 50% of its 2008 value (but is taxed on 2008 values, which the Supreme Court has ruled is a violation of the Constitution, but as of now the government has not changed the valuation basis of the tax). Thus, the application of the memoranda does not raise only economic policy issues, but also serious social issues and issues of democracy and the rule of law.

More than 4,3 million Greeks (50% of those liable to taxation) owe to the fiscal authorities, a total of 95 billion (end of December 2016), which is analogous to 0,54 of the 2016's GDP, and this increases by 2 billion unpaid taxes every month.¹⁷ Many economists, the IMF, and the Budget Office of the Greek parliament believe that the 3,5% surplus is unrealistic in the long run and has negative effects on growth and thus, in debt.¹⁸ Thus a policy re-orientation towards long-term growth and structural reforms is necessary. The Economic Freedom Indicators presented in section 3 show the main areas of reform: Less government and government expenditure, less bureaucracy, lower taxes on profits, lower contributions for pensions, faster litigation¹⁹, facing efficiently the extensive tax evasion and demographic measures. If they are implemented, then Greece may recover quickly and show high income rates. If not, the future is bleak.

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¹⁷ Those owing taxes were only 1 million in 2010. Of taxies certified, only 45% was being collected in 2016 as against 75% in 2010. Thus, the Greek private sector is burdened by a total of 200 billion, which is analogous to 114,2% of the GDP in non-performing loans and unpaid taxes.

¹⁸ Another example of the slowness of the legal system is the Siemens litigation. Siemens is accused (in German and Greek courts) for corruption. The process has just begun in the Greek courts, after 10 years since its introduction!

¹⁹ As reported in the February report of the Greek Budget's Office (coordinator Prof. P. Liargovas) in "To Vima" newspaper 26 February 2017.

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