Memoranda trap and the almost fall of Greece

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ABSTRACT We analyse economic and political developments in Greece for the period 2010-2015, after the introduction of the memoranda agreements between Greece, the European Union (EU), the European central Bank (ECB) and the International Monetary Fund (IMF). We suggest that a vicious cycle took place, austerity measures, badly implemented programs, mistakes of economic policy, unwillingness from the Greek governments to implement structural reforms, political immaturity both from politicians and part of citizens led to the failure of the memoranda and political instability. We introduce a game theoretical approach as a model to the "European game", played by Greece and the EU and the complex and confused situation and diverging aims among the major participants, Greece, Germany, the USA, France, the Baltic states, Finland the IMF etc., as well as a presentation of the June 5th referendum in Greece. We then present our estimations for the sustainability of public debt, followed by our conclusions.

INTRODUCTION

Greece joined the European Economic Community (EEC), the then European Union (EU), (after the Treaty of Maastricht in 1992) as its tenth member in 1981 and the EMU as one of its original members in 2002.

Before the adoption of the euro, Greece, as the other member states, had its own currency, the drachma and followed its own monetary policy, which was expansive and accommodating to the state's (public sector's) needs. The Bank of Greece functioned as the state's finances, printing money to cover the difference between expenditure and revenue, which led to high inflation rates (some years above 20%) and high interest rates, for a long period 18% for deposits, which was lower than inflation, leading to negative real interest rates.

Expansionary monetary policy led to the drachma's fast depreciation, for example, from 1 DEM equal to 7 drachmae in 1970, to 1 DEM equal to 175 drachma ten years later. Supposedly, depreciation of the drachma would lead to higher Greek competitiveness in the traded sector. In fact, this did not happen: Depreciation had only temporary and short-lived effects, but over the whole period 1974-2002 (and later) Greece had a negative trade balance, which was offset by revenues from services, mainly tourism, shipping, and during the 1970-1990's, remittances of Greek workers working abroad, mainly in Germany (Kyriazis, 1985).

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DRACHMA'S ADHESION TO THE EMS

When Greece joined EMU, the situation changed: Greece could not finance its public deficits through monetary expansion, but being an EMU state, it could do so by issuing public debt (bonds) at relative by low interests rates.

Greek politicians (of both big parties which alternated in government between 1975 (after the reestablishment of democracy) to January 2015 tried to satisfy the demands of their political clients, by increasing wages and salaries and increasing employment in the public, introducing relatively high minimum wages in the private sector (840 euro) and keeping taxes relatively low, but even more crucial, not pushing tax collection, implementing tax reforms etc., thus permitting the black economy to thrive (estimated as at about 30-40% of official GDP). Even more, the Greek statistical service "cooked" public deficit and debt statistics, and surprising, the European Statistical Office accepted them as correct.

In 2010, the PASOK socialist government of George Papandreou, which was elected on the promise "*There is money*" (meaning, available financial resources financial resources to implement policies to satisfy voters) discovered the actual situation: public deficit, given by the previous government at about 3-4% of GDP (and thus within the limits of the EMU fiscal stability criteria) 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.[1] Invoking also a lack of expertise in facing debt crises, the EMU called for help the expert, the IMF, to draft program for the financial bailout of Greece, coupled with a 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 to Greece 250 euro, the biggest financial help in history to a country (of just 11 million people and with a GDP in 2010 of 220 billion euro).

In 2012, took place a "haircut" of a Greek debt being held by the private sector (Private Sector Involvement, PSI) by about 55%. Greece was followed by memoranda of the other states, Portugal, (somewhat similar to Greece) Ireland (banking sector induced following the toxic products crash in the USA in 2008) and Cyprus (banking sector induced, due to its banks exposure to Greek bonds). Ireland managed to go out of its memorandum in 2014 and achieved again high growth rates coupled to falling unemployment and Portugal's and Cyprus's situation is improving. Greece's after six years of memoranda is deteriorating and verging a collapse.

MEMORANDA TRAP

Christodoulakis (2014) coined the term "conflict trap" for the Greek Civil War period 1946-1949, during which small and mainly unplaced actions by the two sided (Greek government and communist party) led to unforeseen escalation and increasing violence, resulting in great human and economic losses.

[1] This is also astonishing in view of the fact that such mechanisms did exist in the EMU's predecessor, the European Monetary System, and some countries, such as Italy, did use 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 mechanism superfluous.

We suggest that Greece was caught in a “memoranda trap” where many factors contributed to a vicious cycle of economic recession inducing political instability inducing further economic recession. Up to the time writing (August 2015), Greece has lost commutatively 25% of its GDP (from the 2009 level) unemployment has reached officially 27% and we estimate that GDP losses for 2015 (due to events analysed later on) may reach another 5% and 2% for 2016, bringing total GDP loss to the end of 2015 to 32%, more than that sustained by major economies after the 1929 crash.

Greece’s problem was twofold: excessive public debt, trade balance deficit, due to a lack of competitiveness of the Greek economy. As stated before, public debt was due to an overloaded public sector, due to client relation between political parties-governments and its clients.[2] Thus, the memoranda provided for measures to decrease the size of the public sector (one new employee being hired for five going into pension) plus additional firing of employees, closure of non- performing and unnecessary public organisations[3], corporations etc., streamlining the public sector (uniting for example numerous pension funds into fewer to obtain economies of scale), reduction of salaries. Parallel to the reduction of expenditure, the program foresaw revenue increases through increases in taxation (rat, income and corporation tax and from 2012, a task on property-housing) and an extensive program of privatization of state property.

The first problems arose already here, concerning the mix of measures and the government’s willingness to implement them. First, the mixture of tax increase (two thirds) and expenditure reduction (one third) was wrong, because tax increases have higher recession effects than expenditure decreases, related to their respective multipliers. The PASOK government preferred the increase in taxation instead of reduction in expensive in order to safeguard its client basis, very strong among public employees (who were also letter organized and more willing to go into strike, as for example the employees of DEH, the public electric power company). Parallel to this, although having agreed in general to reduce public employment, the government found ways to procrastinate and postpone reforms. This was the notorious “political costs” theory. In addition trying to protest as much as possible the public burden on the private sector, a policy followed also by the New Democracy government after 2012 (which was allegedly pro-private enterprise).

The end result of the wrong policy mix was a much higher recession and increase in unemployment than anticipated. Over the whole period up to 2014, the private sector lost 1.3 million jobs[4]. IMF’s experts went along the wrong estimation of the multiplier, and even IMF. Director General C. Lagarde had to apologise officially for this error. In order to increase the competiveness of the private sector and ameliorate the trade balance, the

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[2] The situation was almost surrealistic: when asked by the representatives of the troika (IMF, EU Commission and ECP) how many employees the state had (and paid) the answer was “we don’t know”! The state had to implement a census in order to ascertain the number of state employees, which, including the wider public sector (state companies etc.) was close to one million.

[3] A notorious case was “Agrogi”, a public enterprise that employed 285 employees, had a year contribution per employee of about 300 euro! (an all-time labour productivity record!) and induced a yearly 25 million deficit, covered by the state’s budget. It took four years to close it down.

[4] Then Finance minister Mr. Papakonstantinou stated in 2010, that the memorandum would lead to recession of -1% in two years! Many economists estimated deeper GDP losses, as high as -9% to the end of 2011. Actual loss was -10%.

memoranda introduced “internal depreciation”, an attempt to reduce production costs by decreasing labour cost. This was done by reducing minimum wage to 540 euro and the deregulation of labour relations by abolishing collective bargaining for private sector employees, as well as reducing (by 3,4%) employers contributions to social security etc. for their employees.

The main problem here was that labour cost, although important, is one elements of total cost. Concerning other cost elements, Greek private enterprises were on a disadvantage towards most of their competitors: they faced higher energy (mainly electricity) capital (interest rates for loans or private bonds) and profit taxes (26% normal, 35% for companies listed in the Stock Exchange, as against for example 12% Ireland and Cyprus). These rates were nominal, actual burden being higher, because of other charges, as for example the pre-payment of up to 55% of next years’ taxes, which influenced negatively liquidity, “exceptional tax”, property tax after 2012.

Further, again mainly fearing political cost, the privatization program did not progress at all during the first two years. The end result was general dissatisfaction among citizen’s-voters. Political cost was not avoided. Trying to find an escape route Papandreou put forward the idea of a referendum in 2012. EU partners insisted that if a referendum were to take place, it should be about Greece’s remaining in the EMU. The result was that the referendum did not take place, but the Papandreou government full, to be succeeded by a “technocratic” under Professor Loukas Papadimos, which successfully implemented the haircut. It was the first step in the “memoranda trap”, when economic recession brought about a change of government and political instability.

In the next elections (June 2012), New Democracy leader Samaras campaigned under the populist slogan “I will tear memoranda apart”, and his party (after two consecutive elections) was the strongest one, but unable to form a government, not having an absolute majority in parliament (with PASOK, which was reduced from about 42% of votes, it received November 2009, to 12,28%) and the small left pro-European party DHMAR. After forming the government, Samaras forgot his populist declaration and continued with their implementation, implementing some structural reforms, some privatizations, but at relatively slow paces, showing again political parties unwillingness to face “political cost”. Austerity measures continued, recession fall of GDP and increase of unemployment continued, coupled with increased taxation and wages and salaries cuts. Understandably, credibility to the government among voters sunk.[5] Voters considered the government to act as tax pirates.[6]

[5] The new leader of PASOK, after the retreat of Papandreou, Mr. Venizelos, took over the post of Finance Minister, and introduced the property tax on private property (housing). Willingly, waiting to confuse citizens he named it a “duty”, not a tax (although it was not a duty which finances specific services), promised that it would be valid only for two years, but it because permanent. No wonder that his credibility fell, and that PASOK took just 4.68% of votes in the January 2015 elections, forcing him to retreat.

[6] According to Swedish Professor C.H. Lyttkens (Lund University) who named it “predatory taxation” (http://fractalart.gr/democracy-ellada/), when informed that the tax was also levied on 2009 values (before recession) when real values had fallen by as much as 40% according to the Bank of Greece. Thus, Greece was the only OECD state to tax inexistent values. This tax definitely killed the construction sector, one of the Greek economy’s thriving ones before the recession. Greece’s High Administration Court in a decision of November 2014 found the tax unconstitutional, ordering government to implement real values within 6 months.

Not surprisingly, during the EP elections of June 2014, New Democracy lost 3% of its previous voters coming second after the left-wing SYRIZA. PASOK and DHMAR had also serious losses. It was a second step in the memoranda trap, with economic recession leading to political instability. After the June elections, Prime Minister Samaras, practically put an end to reforms, going over to populist declarations. Still, the economy, after four years of recession, showed some signs of recovering, with a low positive growth (of about 0.8%) for 2014.

But the vicious cycle was to continue, the then parliament being unable to give the required 180 votes (out of 300) to elect a new President when the term of the old president expired. This introduced new instability, economic uncertainty and new elections in 15 January 2015, which SYRIZA won on the promise that it would unilaterally abolish the memoranda and that, according to its leader, Tsipras "*we will play tune and the international markets will dance*". SYRIZA became the first party in number of deputies and formed a coalition government with the small right wing "Independent Greeks" party.

Professor Varoufakis, an allegedly expert in game theory became Finance Minister and undertook the task of convincing EMU partners of the necessity of changing the memoranda and negotiating a new agreement.[7] Negotiations dragged on for five months without result, since the Greek side, according to the EU institutions, never presented an alternative credible program, being caught in its pre-election promise of a 11 billion program (the "Thessaloniki Program") of grants, gifts, tax reductions, increase of state employment, increase of state employment, increase of minimum wage to the previous levels, reinstatement of collective bargaining etc.

On June 30 Greece, did not pay 1,5 billion euro due to the IMF, so being in fact efficiently bankrupt, for the fifth time in its history (Zouboulakis, 2015) In order to find a breakout from the impasse, Tsipras declared a referendum on the agreement or not of the 8 billion program (of expenditure acts and tax increases) proposed by the President of the Commission Mr. Jean Claude Juncker. This induced panic among deposit holders, which made necessary the closure of banks (which remained close for 3 weeks) and the imposition of capital controls concerning the export of capital, and daily withdrawal from ATM's at 60 euro (in Cyprus, were capital controls were being adopted after March 2013, the limit was 300 euros).

This again brought the economy practically to a standstill with the danger of "Grexit" (meaning leaving the euro and returning to the national coin, the drachma) and the economic fall imminent. Greece had to come back to negotiations under these near disaster conditions. The referendum took place on July 5 2015 and gave out a 61.3% vote in favour of "No", mainly because "Yes" was accompanied by harsh austerity measures. Next day, the Prime Minister fired Mr. Varoufakis and gave his position to Euclid Tsakalotos, an Oxford educated Professor of European Politics. Mr. Tsipras, understanding the seriousness of the situation and being aware that Greece stood on the brink of Grexit, asked for the support of the opposition parties in parliament to

[7] At the beginning, international and Greek media considered him to be a colorful and interesting personality. By June 2015 he had lost all credibility. According to his own statement, he was hated by everyone in the Eurogroup. Prime Minister Tsipras dismissed him on the 6th of July 2015.

renegotiate, what he got by 251 votes (out of a total of 300 MP's) on the explicit condition that Greece would remain in EMU.

Hectic meetings of Eurogroups, Summits etc. followed, culminating in the longest Summit meeting in history, of 17 hours (!) that reached an agreement, which included a 12 billion program of expenditure reduction and tax increases, for a three year period, refinancing of Greece, and a promise to discuss the alleviation of public debt.

Thus, for the time being and very narrowly, the fall of Greece was avoided.

MEMORANDA AND REFERENDA

We have always been supporters of direct democracy of which referenda are the major expression. Here, we will address briefly some issues.

Direct democracy was invented and practiced in ancient Greek city-states (Ober, 1999) and federations such as the Achaean and the Aetolian (Mackil, 2013; Economou and Kyriazis, 2013, 2015a,b; Economou, Kyriazis and Metaxas, 2015). Modern Greece on the other hand, has no established tradition of referenda and direct democracy in contrast to states such as Switzerland, Uruguay, New Zealand, the USA and Germany (the last two on states, cities level).

Although the Greek constitution (established after the fall of dictatorship on 24th of July in 1974) provides the possibility of top down (eg., decided by the government) referenda, only one such has taken place before 2015, in 1974, concerning the institutional set up of Greece The decision then was in favour of the abolishment of monarchy and the introduction of Presidential Democracy.

The second time that a referendum was discussed as an option, led to the fall of the Papandreou government. Mr. Tsipras did implement the second since 1974 referendum which ked to furious debates in the week before. The referendum had numerous real and technical issues: those in favour of "No" (the government parties, the communist party and the fascist "Golden Dawn" supported "no" for different reasons, but the two government parties explicitly maintaining that "no" would give them a clear negotiating advantage, and by no means meaning Grexit. Opposition parties, which supported "yes" argued that the true issue was Grexit (in case of "no") or remaining in the EMU, in case of "yes".

On a technical level, it was not clear on which program the vote was taken (since the Juncker proposal was already withdrawn). Further, the time available for discussion was extremely short, just one week. The way the question(s) (there were two issues, program acceptance-rejection and debt solution) were put, were absolutely confusing for simple voters (being even a mixture of Greek and English). So each voter voted not on the particular questions, but on his interpretation of them. Lastly, the presentation of the vote was considered by many as biased, since there were not two separate votes (one for "yes", one for "no") but one single paper, with the "no" above the "yes" (a clear alphabetical misuse, since in Greek, letter "N" for yes (Greek: "ναι" precedes letter "O" for "no" (Greek: "όχι").

Even the debate leading to the vote was mainly emotional, and in some cases irrational, invoking "bad Germans", "Nazi collaborators" (accusation for yes supporters), national independence, pride and sacrifice (the "no" invoking a strong emotional parallel to the "no" of Greece against the Italian invasion of October 1940, which lead to the

humiliating defeat of Italy by the Greeks in Albania, October 1940 – April 1941). Even heroes of the Greek war on independence were invoked by the supporters of "No".

What the result showed, once again, was that part of Greek citizens were unable to learn and face reality: they voted for "No" like those of Papandreou, Samaras and Tsipras before, that "No" would lead to a better outcome in the negotiations. In fact, the outcome was worse. Instead of the 8 billion Juncker package, which was rejected, the Greek government accepted a 12 billion new package. Once again, the vicious political economic cycle continues: as a result of the referenda, apart from Finance Minister Varoufakis, the leader of New Democracy, Mr. Samaras, retreated. In parliament, 17 government MP's voted against, or abstained from the new program, which in fact means that the government did not anymore have a majority (it had, before, 161 MP's). Some members of government party and even two ministers, took very strong positions against the program. In conclusion, the 5th of July referendum was a case of "much ado about nothing", but instability inducing in political terms.

THE EUROPEAN ECONOMIC GAME

In this section we formulated the February-July 2015 negotiation between the new Greek government and the EU as a simple game.[8] The game has two players, the new Greek government and the EU, and each has two strategies, agreement and conflict. The aim of the Greek government is postulated as "political survival", while the aim of the EU's) political elites, which set EU strategy, is to force the Greek government to reach an agreement according to the prevailing EU's "rules of the game" and political and economic orthodoxy, eg., to force the Greek government to abandon its pre-election program and populist declarations (as fe. Unilateral declaration of the memoranda being void, the Thessaloniki program etc.).

This would serve as a warning to other countries, such as Spain's "Podemos", that whatever the government, the European rules have to be followed (Pacta sunt servanda) This again would maximize the probability of existing governmental political parties in European countries of remaining in power, and not being ousted by dissenters and anti-European parties like Podemos, Bepe Grillo or Marin Lepen. If the Greek government accepted European terms (and a new memorandum, as it did in July 2015) it would no more be a leftist government, this being a strong signal to other political parties and European voters. Were it not to accept it, then Greece would be forced to leave the EU, and the German Economics Minister Schäuble had apparently prepared a Grexit plan to cover this possibility.

Table 1 presents a game theoretical choice set as far as the strategies and the outcomes that both the Greek government and the EU had to face. By [c] we refer to the cost of conflict for Greece in the case of non-agreement. Since if one of the two players chooses a conflict strategy, the outcome is non agreement (independently of which one does so) in the three of the four cases of table 1. The cost of non-agreement-conflict for Greece would be further GDP loss (up to more than 30% cumulative from 2010), further increase of unemployment, reduction of available income etc., an outcome of disaster or economic fall.

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[8] Presented first in May 10 2015 in the newspaper "Tachydromos". The prediction of the game that an agreement would be reached, proved correct.

Table 1: The Greek and the EU strategies towards in favour or against a new memorandum agreement

	EU strategies	
Greece, Strategies	Agreement	Conflict
Agreement	[a], [p • b]	[c], [p • d]
Conflict	[c], [p • d]	[c], [p • d]

The outcome of conflict for EU is negative, [d], but no so great. It would mean destabilization of the EMU, fall of the euro exchange rate, some GDP losses for its members, but within manageable limits[9]. In the case of an agreement, the outcome is [a] for Greece and [b] for the EU, both positive, for Greece in the long run, due to stability, transfer of EU funds etc. In the short run, the negative effects of the agreement due to austerity measures would predominate, but would be less severe than in the conflict outcome, eg., in all cases $a > c$.

We refine the game by introducing a probability given by the EU that Greek governments would be willing and capable to realise the agreement in view of the EU's mistrust of previous and present Greek government to implement the previous agreements. If p is high, eg. the probability of implementation is estimated so by the EU, then the positive outcome [p • b] is relatively high for the EU, and the cost of non-implementation [p • d] in case of conflict also higher. If p is low, then both the positive and the negative outcomes, b and d are smaller for the EU, thus, favoring a conflict strategy for the EU. In simple terms, if the EU believes that the Greek government would not be willing / able to implement an agreement (making thus the agreement void in fact) then, the option of the conflict strategy becomes the stronger for the EU.

The prediction of the game outcome would thus be, that since the agreement strategy gives better outcomes for both players, eg. $a > c$ for Greece, and $p \cdot b > p \cdot d$ for the EU, an agreement will be reached, as it did. Crucial here is [p], a fact that became clear during negotiations, when Chancellor Merkel and many others on the European side made clear their lack of trust and credible commitment by the Greek government up till then in the negotiations.

The dismissal of Minister Varoufakis and his replacement by Mr. Tsakalotos of lower profile and mere of a technocrat, may be interpreted as a signal by the Greek government of building up trust and credible commitment. In fact, actual negotiations were much more complex than a simple model can illustrate, because the EU was not a single player, but many. We had a game with many players, each pursuing divergent and sometimes

[9] If such an eventuality could approximated by stock exchanges as mechanisms who discount future events, such losses would be small. When Greece's referendum was announced, being interpreted as a signal of possible Grexit, stock exchanges in the USA and the EU had a daily loss of between 3-4%, as against the -25% of the New York Stock Exchange after the fall of Lehman. This showed also that the negotiating threat by Mr. Varoufakis, that in the case of non-agreement (on Greece's terms) the consequences for the EU would be disastrous, was totally unrealistic.

conflicting strategies. We address only a few of them: the IMF, not being an EU member but a player (together with the US) in the negotiations, did favour an agreement linked to a further austerity memorandum, but insisted on a haircut of Greece's public debt, which Germany and other EU countries rejected out of hand.

Within the EU, and in view of internal political considerations and coalition governments, strategies were also divergent, exacerbated by national considerations. Thus, for example, the Baltic states, even now all poorer in GDP per head than Greece, found it difficult to pass in their parliaments measures to grant additional loans to Greece. In addition, they viewed very negatively, due to their mistrust of Russia, Greece's "openings" to Russia.[10] Slovakia and Slovenia sided with the Baltic countries for the same reasons, while Finland, due to the participation of xenophobic party "True Fins" in their government, was one of the hardest against.[11]

The USA, having in mind the wider geopolitical situation, were anxious of political instability in Greece in the case of Grexit, and intervened openly (through president Barack Obama and minister Jack Lew) in favour of Greece. Other countries, like France, Austria and Italy came out strongly in favour of Greece, perhaps also as a show of independence against Germany. Secondary to the main issue of negotiations between Greece and the EU, an important split and decision of interests and perceptions, manifested itself within the EMU, showing also that EMU has no integrated mechanisms and rules for facing new-challenging and unforeseen situations, a situation similar to that after the 2008 crisis. Negotiations involved three EMU levels, the technocratic EMU working group, the Finance Minister's Eurogroup and Summits, but without a perfectly dear structure of decision making, introducing something of a tennis game, with one level referring responsibility to another, only to be given the ball back! This was a further cause of the lengthy duration and confusion of negotiations.

Lastly, even in the German coalition government, and within the CDU party itself, there were apparently substantial differences, with SPD being more in favour of Greece's remaining in the EMU, chancellor Merkel in favour but under severe conditions, and Finance Minister Schäuble clearly in favour of Grexit, having apparently prepared plans for this eventuality. Is Greece's public debt viable? According to the first two memoranda, Greece's public debt was viable, and it should reach 120% of GDP in 2020, compared to 2014's 176%. This was later revised to 124% for 2020.

In a study by a study group of the Faculty of Economics of the University of Thessaly[12] first released in November 2014, the basic scenario (with the highest probability of realization) reached a public debt of 147.3% of GDP in 2020. In June 2015, IMF vindicated our forecast in its latest update, starting that the target of 124% for 2020

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[10] Illustrated by visits of Greece's prime minister and foreign affairs minister to Russia to meet President Vladimir Putin, talks of energy cooperation etc.

[11] The Finnish government forgot conveniently its debt to Greece. Actually, it was during Greece's presidency and the summit of Corfu in 1994 and through the persistent support of Greece that the decision for the EU's enlargement, including Finland, was taken.

[12] Members included, Associate Prof's Stephanos Papadamou and George Iatridis, Assistant Professors Theodore Metaxas, Paschalis Arvanitidis, Iakovos Psarianos, Angeliki Anagnostou, lecturer Lukas Zachilas and Miltiades N. Georgiou, Ph.D, under the coordination of Prof Nicholas Kyriazis and Emmanouil M.L. Economou, Ph.D.

was unrealistic. Here we present our new revised estimate of the basic scenario for the development of public debt, taking into account the new, 3rd memorandum.

We estimate that the three weeks closure of the banks, the imposition of capital controls and the austerity measures and tax increases of the 3rd memorandum will result in a GDP fall of 5% in 2015 and 2% in 2016, about 12-13% billion euro, so that GDP will be in the range of 165 billion by the end of 2016. Compared to 250 billion in 2007. This represents a cumulative fall of about 32% or a third of GDP since the beginning of the crisis in 2009, the biggest ever for a country in a peaceful period, higher than the GDP loss of the USA after the crash of 1929.

We start with a basic provisional estimate of Greece's GDP for the 2015. Greece's GDP for 2014 was 180 billion €.[13] However, after the imposition of capital controls, according to estimations[14], this will lead to further economic decline as high as 5% of GDP loss in the end of 2015 and 2% for 2016 (negative growth rates). Thus, we estimate that GDP will shrink to 180 – 180 • 5% = 171 billion € for 2015 and 171 – 171 • 2% = 167, 58 for 2016 (see table 1, row 2).

Taking it for granted that political stability is absolutely necessary to be achieved in the forthcoming years, this will affect crucially and positively the prospective of the Greek economy, and providing that the current Greek government will start reforms at once, being based on the OECD toolkit, such as privatizations of inefficient and economically damaging public organizations and companies, privatization of public land property as a way of attracting potential investors in areas such as tourism, the drastically facing of bureaucracy and tax evasion[15], etc. We argue that the possibility of achieving growth rates of 1% for 2017, 2% for FY 2018, 2019 and even, 3% for 2020 should not be considered unlikely. Table 2 provides an estimation of Greece's GDP evolution for the 2015-2020 period as a whole. These are rough estimates according to today's situation.

As far as the debt is concerned, it was 325 billion € in 2014. We add an estimate of 20 billion of additional debt as total increase for 2015 and then, we argue that the economy will gradually achieve an annual public surplus of 1% of GDP for 2016, 2% for 2017 and 2018 and 3% for 2019 and 2020, due to the positive effects of the structural reforms (rows 5, 8). Achieving public surplus will give the opportunity to lessen public debt.

We also hypothesize that Greece will have to pay about 3 billion euros a year as interest rates' payments (we accept interest rates as high as 1%) for its loans and also that the government manages to pay annual interests rates, through annual public surpluses (rows 4, 6, 7). Thus not only there is no an extra burdening to the public debt as a whole[16] but also the government manages finally to slightly reduce public debt (from 345 billion € in 2015 to 340,77 in 2020). When it comes to the level of inflation (row 9), we don't include it at this stage. We will include the inflation scenario in an update, when more macroeconomic data will become available.

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[13] http://www.investingreece.gov.gr/default.asp?pid=16, https://forexcorporate.com/news-popup2.php?id=8571

[14] http://money.cnn.com/2015/07/17/news/economy/greece-bailout-recession/index.html?category=economy

[15] Tax evasion in Greece is as high as 25%-30% of GDP % of the annual GDP(!) http://www.theguardian.com/world/2015/feb/24/greece-collecting-revenue-tax-evasion

[16] Interest rates (being variable) fell to 1% on average for 2014, due to the ECB's quantitative easing. If this trend continues, interest payments for Greece will be lower, at about 3 billion per year.

Having taken all the above into account, in table 1 (row 10), we represent the basic estimate, to which we give the highest probability of being realized. The main result is that the Public Debt to GDP ratio (PDt / GDP) in 2020 amounts to 340,77 / 181,28 = 187.9 ~ 188,0 which it will be much higher than the present figure of debt to GDP ratio, 177% for 2014.[17] The estimation of row 10 shows the rapid deterioration of the PDt / GDP ratio for the 2015-17 period. It will exceed 200% of the GDP. But taking for granted that structural reforms based on the OECD toolkit and credible commitment by the Greek governments to adopted them, will be an important prerequisite for the situation to be changed gradually after 2017, for the forthcoming 2018-2020 period.

There is also an additional scenario which may prove to be beneficial for the Greek economy: if we take further into account revenues from privatisations which are used for the reduction of public debt of at least 10 billion (eg. 2 billion per year, a realistic scenario) till 2020, debt will be further diminished to 330,77 billion €. In this case public debt will be 330,77 / 181,28 = 182,5% of GDP.

Table 1: Basic macroeconomic data estimations of the Greek economy for the period 2015-2020

Year	2015	2016	2017	2018	2019	2020
GDP (in billion euros)	171	167,6	169,3	172,6	176	181,28
Economic Growth Rate (%)	-5	-2	1	2	2	3
Interest rates (%)	1	1	1	1	1	1
Public Surplus (A)	0	1,67	3,38	3,45	5,28	5,43
Interests payments (in billion euros) (B)	-	3	3	3	3	3
(A) - (B)[18]	-	1,33	0,38	0,45	2,28	2,43
Public Debt[19]	**345**	346,33	345,9	345,45	343,2	340,77
Inflation (%)	2	2	2	2	2	2
PDt / GDP (%)	345/17= 201,7	346,33/167,6 = 206,6	345,9/169,3 = 204,31	345.45/172,6 = 200,15	343,2/176 = 195	**340,77/181,28 = 188**

So is Greece's debt viable? In order to answer this question a definition of the term "viable" is necessary. A debt is viable if in the long run interest payments (plus a low payment of capital) is possible, so that public debt falls in the long run. This is again possible, if the rate of GDP is higher than the interest rate, because this means also that higher tax revenues are generated, so that public debt does not increase, higher GDP growth means that the ratio of debt to GDP is being reduced.

[17] http://www.tradingeconomics.com/greece/government-debt-to-gdp

[18] When (A) – (B) < 0 the sum is added to each year's public debt. By contrast, when (A) – (B) > 0, the sum reduces each the annual public debt.

[19] We make the hypothesis here that paying the interests payments can be feasible without any extra burden of the Public debt.

An additional issue if depends on the willingness of markets to finance it, on issue of trust towards the country that issues the debt, and its government. Japan has a higher public debt ration than Greece, 226% in 2014 but up till now the question of it being viable has not been raised, mainly because the Japanese themselves are willing to buy Japanese bonds, trusting their government and because they have high saving rates. Both conditions do not apply to Greece, were saving rates have become negative, capital outflows were substantial before the imposition of capital controls and deposits in the national banking system were falling, to about 120 billion in June 2014 (compared to a GDP of 180 billion in 2014, a low percentage of 66% and trust to their government both by Greek nationals and markets reached low ebbs.

So, in the long run, the viability of Greece's debt depends on low interest rates (which again depend on a decision by the EMU, since 250 billion of debt is held by the official sector) and positive growth rates, which is the most importnant issue. As we propose above, Greece will have negative rates for 2015 and 2016, possibly achieving positive growth after 2017, but this again depends on Greece escaping the memoranda trap.

CONCLUSION

Measures agreed under the third memorandum of July 2015, led first to an insane and surrealistic political situation: Out of 162 MP's of the government coalition, 39 voted against, during the second vote, on the prerequisites for signing the agreement, including 3 ministers and the President of the Parliament. But the memorandum laws were passed with 222 votes in favour, because the MP's of the three main and pro-European opposition parties (New Democracy, "To Potami" and PASOK) voted in favour!

It's a unique situation, where the opposition comes from within the government from the so called "Left Platform" and support from the opposition! This compelled Prime Minister Tsipras to make changes on 17th of July, firing 8 if his ministers and deputy ministers and replacing them by 8 new and more pro-European ones. Still, important doubts remain both within Greece and the EU as to the willingness and possibility of the government to implement the measures, especially since the prime minister expressed openly the view that he has not believe in the program. Chancellor Merkel and other European personalities on their part the question of mistrust. It takes long to build up trust, but it is easy to destroy it, as Greece's recent events again demonstrated.

This again bring into the foreground the issue of political instability, with new elections within 2015 being almost certain, and their issue doubtful[20]. A split within SYRIZA has a very high probability. Will new parties appear? How much would SYRIZA loose, and opposition parties win? Will new political personalities appear to replace the old ones? During this period, Greece did not lack politicians but did not have a single leader.

The new memorandum includes measures of about 12 billion. "Tax piracy" continues and increases, by raising profit tax from 26% to 28%, vat on restaurant from 13% to 23%, for hotels from 6,5 to 13%, for many alimentation items etc. from 13% to 23% and for energy bills etc. for 13% to 23%. Property tax (the so-called ENFIA tax) will be retained

[20] Nicholas Kyriazis among others, in a series of newspaper articles in Greek press estimated that the new government would not remain in office for the whole four year duration. He was being optimistic, because apparently it will remain in office for less than a year.

for two years in the present form. In addition, there are new pension and social security cuts and wage reductions will follow. In this, the new memorandum follows the old ones and will bring about a severe recession.

Concerning structural measures, privatization agreed on the old memoranda (airports), ports, train, land etc) are reconfigured, and a new Fund will be introduced of 50 billion, which will include various state properties, as a kind of collateral for the official loans given to Greece. The so called "toolkit" of OECD will be implemented in order to strengthen competitiveness providing (yet again) for example the opening up of the so called "closed professions" (ranging from hairdressers and pharmacists to lawyers and notaries). The new memorandum measures represent a total reversal of SYRIZA's ante-election program of 12 billion benefits. Instead, there is a 12 billion austerity measure program, plus a 12 billion loss of GDP up to 2016, a total difference of 36 billion between promises and realization. We expect that this will bring about further political instability after the new elections, and that the vicious cycle of the memoranda trap will continue.

In conclusion, Greece suffered from three badly conceived and badly implemented programs, that put emphasis on tax increases, less on expenditure cuts and even less on structural measures. The alleged experts of the IMF were notoriously unable to correctly calculate even simple price demand elasticities. For example, the increase of vat on restaurant from 13% to 23% bought about a reduction of demand, a fall of revenue and an increase of unemployment in the sector. The reduction from 23% to 13% before the summer of 2014 reversed the trend in a clear proof of the validity of the Laffer relation. The equalization of fuel tax for heating (which was before lower) to that of motoring, brought about a dramatic fall of demand, because people went over to substitutes like pellets, coal, wood for fireplaces etc., with a corresponding fall of of revenue. Still, IMF and the troika seem unable to learn from experience and once again raided vat on restauration to 23! Also, the raising of vat for hotels will make the sector, one of the few remaining competitive ones, less competitive.

Thus, for the time being, the vicious cycle of the memoranda remain. We see two ways to break out of the trap: In order to restore political stability, confidence, trust and credibility, pro-European political parties must come to a general agreement on future policy that will be implemented in broad lines independently of government changes, as happened in the other memoranda countries. Recent events seem encouraging in this respect. In order to restore economic growth, a change of policy is necessary. We hope that the troika will understand this, and once political stability is established, they will be willing to correct mistakes. The new policy should aim at tax reduction in order to make companies and the economy more competitive, relation of expenditure in areas where waste, duplication etc., still exist, and most importantly, strong emphasis on structural measures that will enhance competitiveness.

If this happens, then Greece will find again its way into growth. If not, then Greece will be transformed for decades into the Argentina of the Mediterranean.

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