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## **Re-Evaluating The Keynesian Multiplier: Critiques And Evidence From Europe**

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# Re-Evaluating The Keynesian Multiplier: Critiques And Evidence From Europe

by  
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## ABSTRACT

This paper starts from Keynes' General Theory to demonstrate the existence of a non-linear Keynesian multiplier on the grounds of cross-country data. Thus, we prove the effectiveness of short-run countercyclical exogenous stimuli during downturns. The role of fiscal spending is discussed in light of different schools of thought, including the well-known "*expansionary fiscal contraction*" theory. Moreover, we examine the European fiscal rules of convergence – aimed to sovereign debt sustainability – that affect the size of "*fiscal space*". Empirical data from several Eurozone countries provide evidence of traditional multipliers. Furthermore, the Greek economy displays a non-linear case of multiplier. This leads to rejecting the assumption of a weak Keynesian setting, which supported instead the IMF-backed fiscal contraction.

*JEL codes: E12, E17, E61, E63, E65.*

*Keywords: Keynesian Multiplier; Expansionary Fiscal Contraction; Euro Sovereign Crisis.*

## 1. Introduction

The euro sovereign crisis rekindled a never-ending debate on Keynesian fiscal multipliers. Specifically, the policies the Troika – European Commission (EC), European Central Bank (ECB) and International Monetary Fund (IMF) – initially imposed on crisis countries hinged on hypothesizing negligible fiscal multipliers, supporting either the idea of expansionary fiscal contractions or the idea of weak Keynesian settings. Over time, however, growing awareness built that the hypothesis of fiscal multipliers being negligible might be faulty. If that is the case, the policies prescribed by the Troika were also erroneous.

This paper is devoted to re-evaluate the actual size of the fiscal multiplier on cross-country data. Our results are generally supportive of fiscal multipliers being non-negligible. Furthermore, in view of the mentioned debate on the size of the fiscal multipliers in euro crisis countries, we focus also on re-assessing the Keynesian fiscal multipliers of these countries on recent data. While fiscal multipliers are found to be greater than one in all examined euro countries, we find the size to be much above unity in crisis countries, and particularly in Greece. Thus, our results bring additional support to the vision that an in-depth revision of fiscal policies is in order throughout the Eurozone, and even more so in the euro crisis countries.

In the rest of the paper, section 2 draws the general background on the Keynesian multiplier. In section 3 we discuss the issue of linear vs non-linear multiplier and multiplier in normal times vs downturn episodes. Section 4 moves on to the main critiques of the Keynesian Multiplier and the expansionary fiscal contraction view while section 5 reports new views in support of the Keynesian Multiplier, and section 6 takes to the EU Policy Debate. Section 7 concludes.

## 2. The Keynesian Multiplier: Background

An important economic indicator is represented by the Keynesian multiplier, which states how effective an exogenous stimulus can be to boost national income. Such stimulus could be represented through a multitude of channels (government spending, investment, exports etc.). The usefulness of this indicator has been considered when evaluating whether a Keynesian or Neoclassic environment prevails. In particular, the Keynesian multiplier assumes a short-run analysis and fixed (or at least sticky) prices. An IS-LM model could be well suited to the Keynesian analysis. In fact, a short-run analysis (where change is restricted to a single production factor) focuses on dynamics where only one variable reacts while the others are held exogenous. For this

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reason, the Keynesian multiplier is mostly committed to demand-side policies. As a premise, the Keynesian multiplier – in order to be estimated – leads to reach these objectives (used to define “space” for multiplier): its goal consists in the matching between AD and AS curves (in short-run), The potential output could be described with the following formula:

$$Y = f(L, K)$$

With input variables for labour and capital, the ascribed formula can be used as a neutral assessment of Keynesian and non-Keynesian effects. Even if some economists argue the need for augmenting the number of inputs, there are still reliable signs to simplify by using only labour and capital, since most calculations based on these inputs are used for forecasts. The Keynesian multiplier is strictly linked to “*the fundamental psychological law*” by J.M. Keynes (1936), which claims that consumers only consume a part of their income (where  $c$  is the marginal propensity to consume,  $0 < c < 1$ ); therefore, interest rates do not alter savings (i.e. wealth), but how such savings are distributed between assets and money. In other words, the Keynesian multiplier should not be affected by interest rate variations, if no crowding-out effect is assumed. Moreover, during downturns, economic agents expect future interest rates to rise for fixed-income assets (no further price increase is expected). This econometric indicator is particularly useful in cases of downturn, as proved by the 1929 USA overproduction crisis. At that time, the Neoclassic theories were insufficient to explain why markets were unable to self-regulate to provide an economic boost, claiming that downturns had to be imputed to credit deficiency (i.e. a supply-sided credit easiness has been claimed as the solution). That is to say, there is a preference for liquidity since agents do not expect a future reliable increase of value for assets (i.e. monetary policy is not always an effective instrument). The founder of the Keynesian multiplier (a student named Daniel Kahn) focused on the importance of a demand-led stimulus (exogenous to markets), claiming that any policy implemented without considering the aggregated demand, would result in a failure to boost economy (especially in cases of downturn). The Keynesian multiplier has been recognized as an instrument to sustain effective demand “so that entrepreneurs will hire all domestic workers willing and able to work” (Davidson, 2010). Although, the Keynesian theories have been withdrawn after the Bretton Woods collapse at the beginning of the 70s, a worldwide gold-currency pegged exchange rate regime backed by the US-dollar which guaranteed worldwide trade across countries, as monetarism claims (which in turn has been criticized by the lack of linkage between money and GDP growth during the 2001-2003 period). In short, the primary drawback of the Keynesian theory was “stagflation” (simultaneous existence of inflation and increasing unemployment). Essentially, in the Keynesian formula we have parts which are “income-dependent” like consumption and imports, and other components which are exogenous since they consist of the starting stimulus to be implemented for multiplying effects. The formula, existing in an open economy, is represented by the following:

$$Y = C + A$$

$$C = C_0 + cY$$

$$A = I + G - T + X - M$$

$$M = M_0 + mY$$

Finally, it yields this specific multiplier (no taxation on disposable income is assumed here):

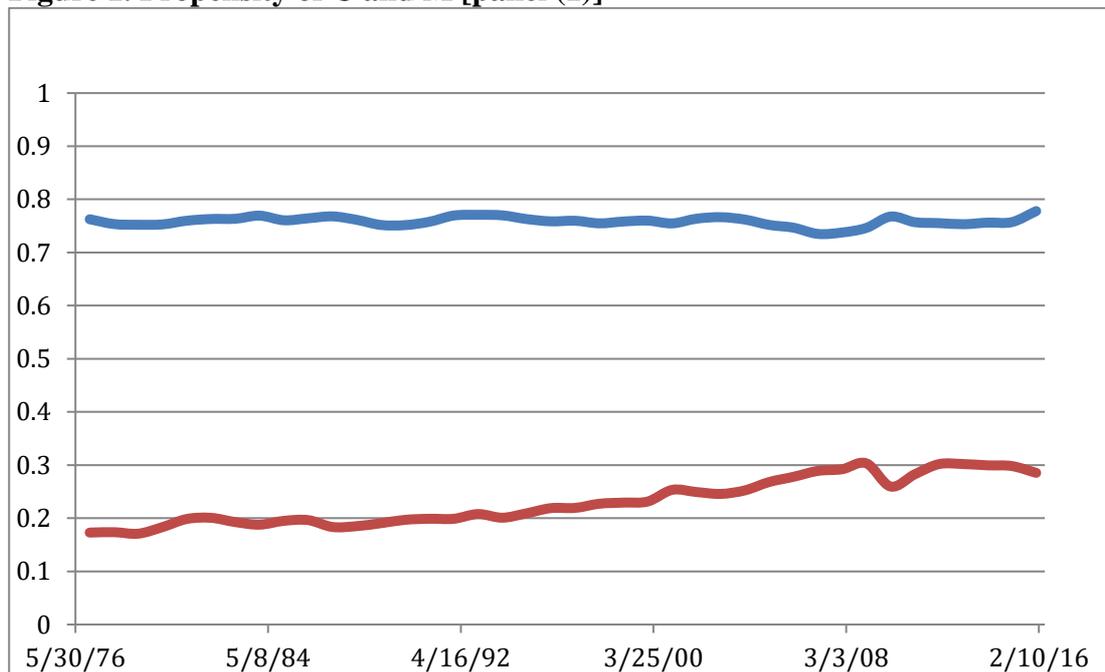
$$\frac{1}{1 - c + m}$$

We are reminded that a stimulus could be implemented even from the side of currency markets, when considering the existence of a Marshall-Lerner condition (i.e. sum of elasticities of imports and exports greater than one supports currency devaluation for a current account balance improvement, otherwise a currency re-evaluation is suggested).

It is necessary to remark that this type of multiplier does not include fiscal effects of automatic stabilizers (e.g. linked to disposable income taxation), which will be considered in the next chapters. Here is a version of the multiplier that includes taxation on disposable income:

$$\frac{1}{1 - c(1 - t) + m}$$

**Figure 1. Propensity of C and M [panel (1)]**



### 3. Linear vs Non-Linear Multiplier and Normal Times vs Downturn Episodes

A common debate among economists is whether or not the dependent combinations between imports and consumption are linear or non-linear. This difference is crucial to estimate how far fluctuations of multiplier could be considered as merely stochastic or not. Since there are different multipliers during “normal times” and “downturns”, some economists attempted to describe these variations by even including dummy variables in cases of downturn. As a premise to this part of the discussion, there is an important econometric coefficient represented by the elasticity to income of consumption and imports, which could be construed as a ratio between percent variations, or marginal to average propensity ratio. As reminded by differential calculus, elasticity is strictly linked to the exponent of the “income-dependent” aggregate. In the linear case within an open economy (assumed by most of the textbooks), consumption and imports grow at the same speed of income, thus there should not be a reason, in and of itself, to estimate a deterministic variation of the multiplier. Instead, in the non-linear case in an open economy (demonstrated by elaborations from the World Bank WDI database, 2016; Excel databases: NE.IMP.GNFS.ZS, NY.GNS.ICTR.ZS, NY.GDP.MKTP.CD) there is an important estimation of the possible variation of multiplier during downturn. In the following panel (1) there is the proof for assuming non-linear case of the multiplier, where the data is derived from a weighted average of the world countries propensities on consumption (blue line) and imports (red line) (Figure 1).

We implemented an array of time series analysis on panel (1): we considered the blue line to be a stationary and stable process, meaning the elasticity to income of consumption is equal to one (clearly a stationary process, especially since world GDP growth has been on average stable and positive). Here we assumed an average GDP growth rate of 3.5% annually (world GDP growth rate has been positive for seventy years). Dealing with the propensity to import, we found an interesting behaviour (strictly linked to the phenomenon of globalization): Since it is not a *random walk* (if including a trend in an ADF test, a confirmation is provided by a KPSS test), so there is a “predictability” of the slope. We could use an OLS regression to estimate intercept and slope of the red line. We found that it is significantly upward sloped (p-value < 0.01), depicting an average elasticity to income of imports equal to 2. In simple terms, if income grows by 1%, imports grow by 2%; moreover, marginal propensity to imports is almost twice its average propensity to imports. Therefore, we are permitted to use an estimation by OLS as no persistence on trend has been found. Below we report an OLS regression on propensity to imports from panel (1), where data are referred to as percent values (Table 1). This panel proves that elasticity to income of imports is greater than one:

**Table 1. OLS Regression on Propensity to Import**

INTERCEPT	SLOPE	STANDARD ERROR	T-TEST (against H <sub>0</sub> )	P-VALUE
10.29	0.3508	0.01	34.01	1.27 · 10 <sup>-38</sup>

A simulation of data based on a non-linear case could be useful (the first exercise is referred to “normal times”, Table 2a; the latter to downturn episode, Table 2b); here we assumed a constant-by-time elasticity model. In each graph, we described the effectiveness of an exogenous stimulus during normal times and downturns.

**Table 2a. Multiplier in “normal times”**

time	Case M = mY <sup>2</sup>		
	Y	C	M
t = 0	100	70	50
t = 1	105	73,5	55
increase absolute value	5	3,5	5
increase percentage value	5%	5%	10%
elasticity to income	-	1	2
marginal propensity	-	0,7	1
average propensity	-	0,7	0,5
Keynesian Multiplier	0,77		

For simplicity, we could ignore the fact that the upper multiplier is less than one.

To be honest, similar conclusions could be advanced even in cases of constant autonomous aggregate (thus proving a constant-by-time elasticity on average) and varying elasticities. The last graph, in comparison to the previous one, illustrates a decrease of marginal propensity to imports which is known as the “*investment accelerator*” (which affects investment for importing goods and services), a mechanism used to reduce exposure to foreign debts.

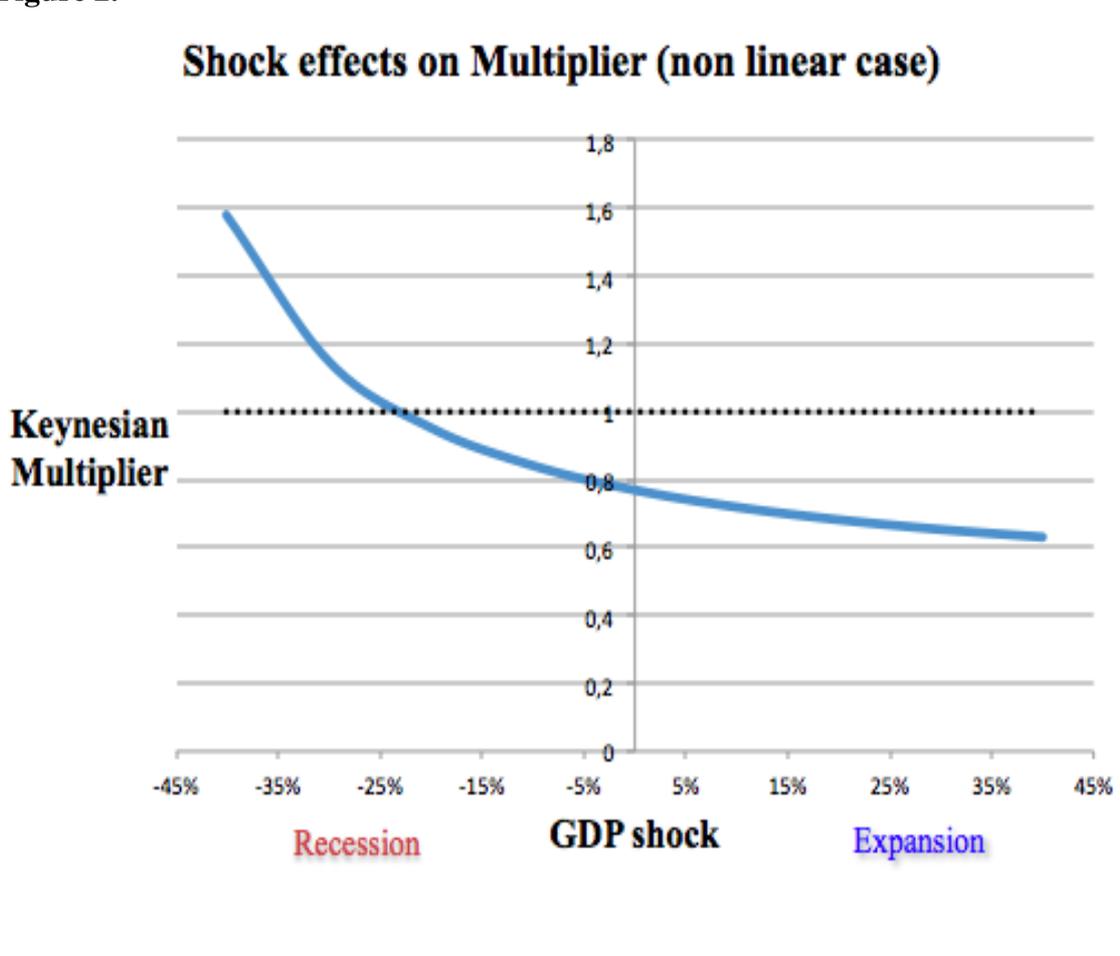
As we can see, an augmentation of the Keynesian multiplier is allowed when elasticity to income of imports is greater than elasticity to income of consumption (otherwise we would have to expect a collapse), assuming proper values for aggregates.

**Table 2b. Multiplier in “downturn episodes”**

time	Case M = mY^2 (during downturn)		
	Y	C	M
t = 0	70	49	20
t = 1	73,5	51,45	22
increase absolute value	3,5	2,45	2
increase percentage value	5%	5%	10%
elasticity to income	-	1	2
marginal propensity	-	0,70	0,57
average propensity	-	0,70	0,30
Keynesian Multiplier	1,15		

In this last case, for instance, a fiscal stimulus would have an expansionary effect on income (i.e. if  $G$  increases by 1%, then  $Y$  reacts by 1.15%). Our simulation — plotting a short-run simulation for each alternative scenario — is illustrated here (Figure 2).

**Figure 2.**



**4. Critiques of the Keynesian Multiplier and the Expansionary Fiscal Contraction View**

An important article by Krugman (2015) argued that the more a country’s GDP goes up, the lower elasticity to income of imports becomes (i.e. it exponentially decays to 1 in the long-run). This is acknowledged when considering projections and estimations on propensity for imports to grow by a constant pace (slope) and assuming a constant average GDP growth rate; in other words, this would

mean that relying on fiscal policy is not an everlasting strategy to be implemented. Hence, here is the matter for the developed countries, while developing countries could have higher elasticities to income (expected higher volatility of multiplier, assuming other factors to be constant or neutral).

Instead, a confirmation to our analysis on non-linear case persistence could be found in researches by Auberbach and Gorodnickenko (2011), who confirmed presence of expansionary effect on GDP of fiscal spending in case of downturn (SVAR methods have been used to assess Granger causalities across variables).

Another important critique advanced on the multiplier lies on the “crowding-out” effect (here: government spending depresses investments), thus vanifying effectiveness of government spending on investments (the greater interest rates effect investment sensitivity, the greater the crowding-out effect). Furthermore, as the crowding-out effect increases, the multiplier decreases. Notwithstanding, we could appreciate Keynesian effects when considering negligible crowding-out effects (especially in light of the ZLB assumption due to the European Central Bank commitment on its expansionary monetary policy). So, we have to emphasize the crucial importance of money market into the reliability of the Keynesian model, since money holds three functions: unit of account to set the prices of goods and services, transaction instruments, store of value. Therefore, an expansionary fiscal policy can be implemented in several ways: tax reduction, government spending financed by issuing treasury bonds (it being more beneficial if bonds were purchased by households), and government spending by tax withdrawal (e.g. the Haavelmo theorem).

There are two opposing schools of thought on the usefulness of fiscal spending: 1) to defend or 2) to confute fiscal spending as a boosting instrument. This crucial argument could be considered as the milestone to trust in the Keynesian multiplier, since a fiscal stimulus represents the autonomous component of national income, where the others are not affected by other components. Critics are not necessarily refuting the usefulness of the Keynesian multiplier (in itself) as a descriptor of the effectiveness of fiscal spending; but rather, its use would lead to several problems when assessing if fiscal spending actually provides the expected traditional boost to the economy. A panel borrowed from Briotti (2005) could be useful in summarizing all these viewpoints (Table 3).

**Table 3.**

Table A Potential impact of budgetary adjustments on economic activity			
Taxonomy	Main underlying assumptions	Definition	Value of the Multiplier
Traditional Keynesian Multiplier	Slack in productive capacity; fixed price; static model.	Increase in income following exogenous increase in public expenditure or tax cut.	Positive and greater than 1.
Weak Keynesian	Productive capacity close to full use; market interest increase; exchange rate appreciation.	Partial or full crowding-out side-effects of budget changes limit the size of the multiplier.	Between 1 and 0.
Ricardian equivalence	Intertemporal optimisation; forward looking agents; no liquidity constraints.	Precautionary behaviour of economic agents fully offset fiscal policy changes.	Multiplier equal to 0.
Non-Keynesian	Intertemporal optimisation; large fiscal imbalances; risk premium on interest rates; credible fiscal consolidation.	Prompted by a credible fiscal consolidation, agents' expectations about future fiscal policy and future income improve.	Negative or close to zero.

In other terms, only when the Keynesian multiplier is greater than 1 can we discuss a Keynesian setting (or at least about non-relevant crowding-out effects), otherwise we face weak Keynesian or non-Keynesian environments, or Ricardian behaviours.

Succinctly, the Ricardian equivalence lies on these assumptions: a) there is an intertemporal optimization through an intertemporal consumption function; b) an increase of public expenditure induces negative expectations on future incomes (since a severe tax withdrawal is expected to be implemented in the future, which is referred to as “altruistic behaviour” across generations), that is to say, economic agents’ behaviour offsets fiscal stimulus effects (sharing forward-looking rational expectations); c) capital markets are perfect.

To argue against fiscal spending as a policy to boost the economy, we could refer to a paper by Considine and Duffy (2007) about the expansionary fiscal contraction (when the multiplier is negative), where the role of institutions to encourage economic operators of the goodness for present readjustment. Alesina and Perotti (1997) and Ardagna (2004) argued that the mechanism of fiscal policy may have economic effects via the labour market as a result of reducing public spending (especially salaries) instead of rising taxes. Moreover, the budget deficit is reduced through cuts in social expenditures (unemployment subsidies, minimum income subsidies) and cuts in public sector wages, or the budget deficit is reduced with the increase of taxes on labour income and with cuts in public investment expenditures (Afonso, 2006). Perotti (1999) and Cour et alii (1996) noted that during the 1980s several countries with large government debt or deficit implemented deficit cuts, and contrary to some expectations, in several cases private consumption boomed rather than contracted, in tribute to the Ricardian assumption. It is evident that expansionary fiscal contractions mostly focus on effects on private consumption due to tax increase examined by Blanchard (1985) through an intertemporal consumption function. An increase of taxes provokes a reduction for present generations’ current consumption in favour of future generations, thus reducing uncertainty for future fiscal policies. Consumers can then reduce accumulated savings, probably an amount of savings destined to honor future fiscal duties which are not expected to occur again. This last effect could prevail especially in high debt-to-GDP ratio countries because of perception of a potentially high problem of future fiscal sustainability.

Controversial arguments have been raised in several cases of countries with low debt-to-GDP ratios and low deficit-to-GDP ratios (i.e. strong fiscal position), where Keynesian behaviours are recognized; instead Ricardian assumptions are mostly identified in countries with high debt-to-GDP ratios and high deficit-to-GDP ratios. Huidrom et alii (2016) confirmed in an article by using IPVAR methods that both on impact and on long-run multipliers are very low; even lower in cases of “weak fiscal position” (high debt-to-GDP ratio). These methods focused on the *Ricardian channel* and the *interest rate channel*: the first works mostly in countries with weak fiscal positions as described by the Ricardian equivalence; the latter works through the expectation on interest rate on sovereign debt to increase when the country has a weak fiscal position, worsening the sentiment of lenders (government spending increases bond yields because of the increased risk premium) and depressing investment (indeed,  $I = I_0 - bi$ , where  $b$  is the sensitivity of investment to interest rate, liable of the crowding-out effect). In particular, private consumption and private investment are crowded out by expansionary fiscal policy in case of a weak fiscal position; while in case of a strong fiscal position, an increase of private consumption and private investment occurs until a certain threshold.

These arguments are not claiming that fiscal spending is useless during a period of decline (especially in this historical period of low borrowing interest rates and large infrastructure needs), in particular through well-designed, medium-term fiscal programmes and productivity-enhancing structural reforms.

At the end, we recall the notorious hypothesis of the “expansionary fiscal contraction” by Giavazzi and Pagano (1990) who referred to the examples of Ireland in 1987-1989 and Denmark in 1983-1984. Even if this assumption should have to be taken as an experiment (as acknowledged by the authors), they found out that a reduction of government spending could improve future expectations on taxes (in tribute to the Ricardian equivalence), thus encouraging private consumption. Although, such an assumption has been criticised because Keynesian models do not recognize an expansionary effect on fiscal contraction (to clarify: taxes have depressing effects on consumption in any case, as

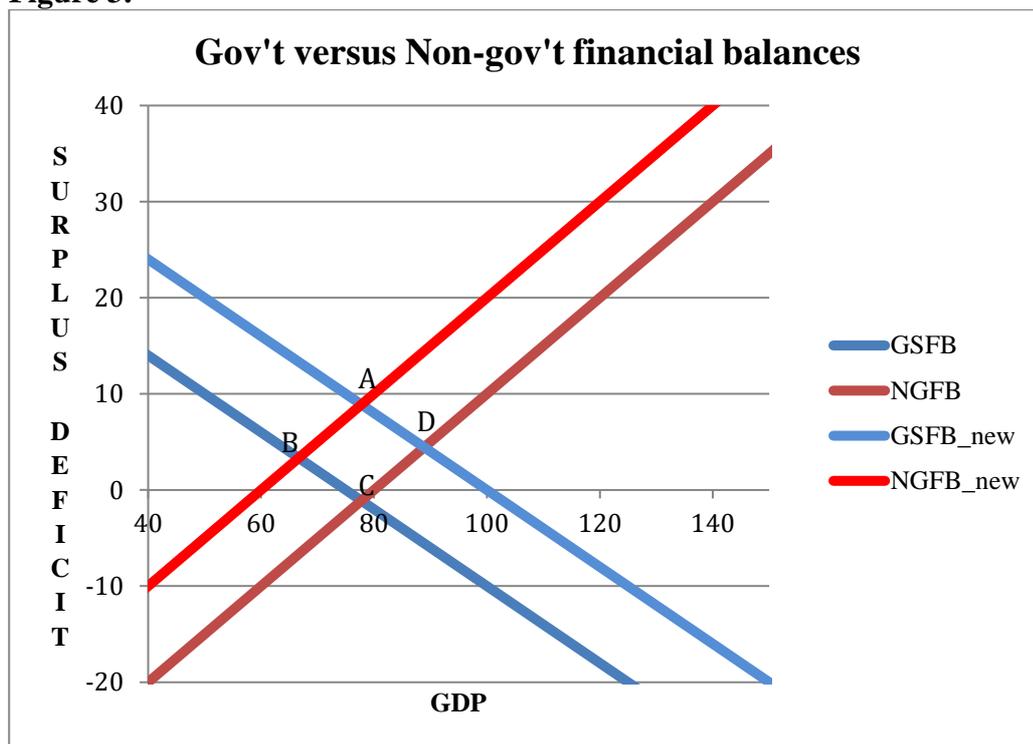
remarked by Giavazzi's VAR model). Moreover, their autoregressions displayed relatively significant results for coefficients of aggregates (expressed in percent of income): probably such results depended on exogenous supply-side shocks (e.g. real wage deflation). It could be misconstrued that the main difference between the expansionary fiscal contraction hypothesis and the weak Keynesian assumptions is on the reaction of GDP to fiscal contraction. The first assumes GDP to rise, the latter to fall. At the end, someone could argue that the expansionary fiscal contraction seemed to be significant in those cases mostly because of a supply-side reform for real wage deflation. (It has been discussed whether an even higher expansionary effect on GDP could be reached by a fiscal stimulus).

### 5. New Views in Support of the Keynesian Multiplier

In support of the need for fiscal spending, we find a paper by Coenen et alii (2012a), who focused on quarterly multipliers and long-run multipliers (both on impact and standardized fiscal stimulus). They focused on government spending, government investment, government transfers, consumption taxes, labour taxes, social security contributions by employers and employees. Even a Neoclassic identity as the SCF theory – inspired to a paper by Godley and Zezza (1986), edited by Pezzotta (2013) – argues the need for government spending in case of a downturn.

$$S_{private} - I = (G - T) + (X - M)$$

**Figure 3.**



From this identity, where each imbalance is outweighed by the other factors, we find out that an increase of the GDP corresponds to a surplus for the private sector financial balance, the current account balance (i.e. the sum of these ones could be equalized as the non-government financial balance), while it corresponds to a deficit for government sector financial balance (Figure 3). Equilibrium is found where the two equations can be balanced. Here movements of the government sector financial balance (GSFB) are due to policy makers' choices, movements of the non-government sector financial balance (NGFB) are due to consumers' reactions.

For instance, we suppose a starting situation in point C, pushed away by an economic shock which pushes up the NGFB (moving equilibrium from point C to point B). Therefore, B is a situation of current improvement of net balances (a surplus is gained), mostly due to cuts in imports rather than rising exports. This situation is associated to a consumption depression due to uncertainty on future consumption, so consumers tend to curb their consumption of both homeland and foreign products. GDP in this case drops. As suggested by this last graph, only an increase of government expense can restore the previous level of GDP, which implies an increase of surplus for the economy, although from a policy making viewpoint it means government expenditure could fall into deficit. From another viewpoint, to better appreciate what would occur if a contractionary fiscal policy were chosen, we could assume to start from point A leading to point B, which implies a worsened net surplus – if not a deficit – and lower GDP. From a certain perspective, such behaviour of some economic operators could be construed as “austere”, but it actually provokes a depressing procyclical mechanism which worsens both GDP and net surplus (tending to become a deficit). What we can learn from this graph is how long a government could give its financial resources to restore consumers’ confidence in their financial possibilities. In fact, moving from B to C, the demand of private savings is decreased, and so is its surplus. A sliding red line of GFSB pushed downward implies also an increase of leverage (typical effect provoked by the mechanism of the Keynesian multiplier).

In fact, Volpi (1976) revisited lessons by Puviani (1903) about the questionable Ricardian equivalence, mostly imputing to some lacks of rationality in contrast to the Ricardian assumption. This phenomenon is known as the “fiscal illusion”: taxpayers perceive a different level of sacrifice than the real one for fiscal utility/disutility. We focus the most on the “optimistic fiscal illusions”: a) ignorance of fiscal expenditure occurred; b) ignorance of real destination of fiscal spending; c) ignorance of the amount of fiscal expenditure; d) ignorance of fiscal policy duration; e) ignorance of the fiscal policy implementation phase; f) ignorance of government’s purpose for fiscal spending; g) ignorance of short- and medium-term effects of fiscal spending; h) ignorance of real causes of fiscal expenditure. This argument is also raised by differences between higher and lower social classes where the latter do not know how economics work (thus economic operators are myopic and the market cannot self-regulate).

Another econometric indicator used to measure the extent of fiscal space for the Keynesian multiplier is represented by the NAIRU (as good as the NAWRU for projections because of the similarity of their behaviours, as noted by Richardson et alii, 2000). NAWRU is estimated as a first lagged autoregressive model with drift, unemployment rate as a second lagged autoregressive process; NAIRU is linked to the Phillips’ curve. According to the Keynesian doctrine, workers are reluctant to nominal wage reductions and share static price inflation expectations. This indicator is useful to determine the output gap (i.e. percent ratio between current output on potential output minus one), which is in turn linked to definition by the Italian Ministry of Finance and Treasury (2013) of the cyclically adjusted account balance (i.e. medium-term objective in light of the EU rules; it is strongly affected by the difference between elasticities to income of government spending and taxes). An article by Cottarelli (2015) emphasized the importance of slowing down fiscal adjustment when spare capacity is found. The formula used to calculate both the potential and the actual GDP looks like this (borrowed by D’Auria et alii, 2010),

$$Y = f(L, K) \quad TFP$$

(assuming constant returns on scale and each output unit to be produced by the same proportion of capital and labor).

A remarkable problem is the definition of capital as a sum of past investments, which risks underestimating the actual demand situation. Moreover, looking at short- and long-term could be misleading, maybe a near-term sight would be the best choice for analysis of effects of fiscal policies. To summarize, labor is negatively related to NAIRU (and NAWRU), given as constant

other variables. The main problem on estimating “fiscal space” (thus MTO) is related to the “*principal-agent problem*”, where the principals are the Member States and the agent is the EU Commission hired to verify coherence between fiscal spending programme and its MTO, where each actor plays different interests (the one to guarantee stability, the other to look for more fiscal space). In conclusion, only Germany has an unemployment rate lower than its NAIRU, while France, Greece, Italy, Portugal and Spain have higher unemployment rates than their own NAIRUs (during the 2009 downturn each country displayed an inversion of unemployment rate on NAIRU). An interesting critique advanced on these methods to estimate MTOs consists of the “*vexata quaestio*” which emphasized the potential risk to overshoot pro-cyclical fiscal policies (i.e. to underestimate fiscal needs for countries during downturns or to overestimate fiscal needs for countries during expansion). Clearly, these methods are focused on a supply-side economic policy, where a risk of demand-led inflation should be better erased. But an interesting discussion could be had on whether or not during exogenous shocks (e.g. downturn provoked by a financial crisis) demand reacts faster than supply, considering that production factor mobility plays an important role.

## 6. The Multiplier in the EU Policy Debate

While looking at the EU rules, an important role is played by fiscal policies aimed to unite the Maastricht’s Treaty and the Stability and Growth Pact. The rule/policy states that the following conditions must exist in order to stay in a single currency area (as noted by Buti et alii, 2013): deficit-to-GDP ratio lower than 3%, debt-to-GDP approximately to 60%, inflation close to the average of the three lowest inflation rate countries, long-term interest rates not trespassing threshold of 2 percentage points above the lowest rate Member States.

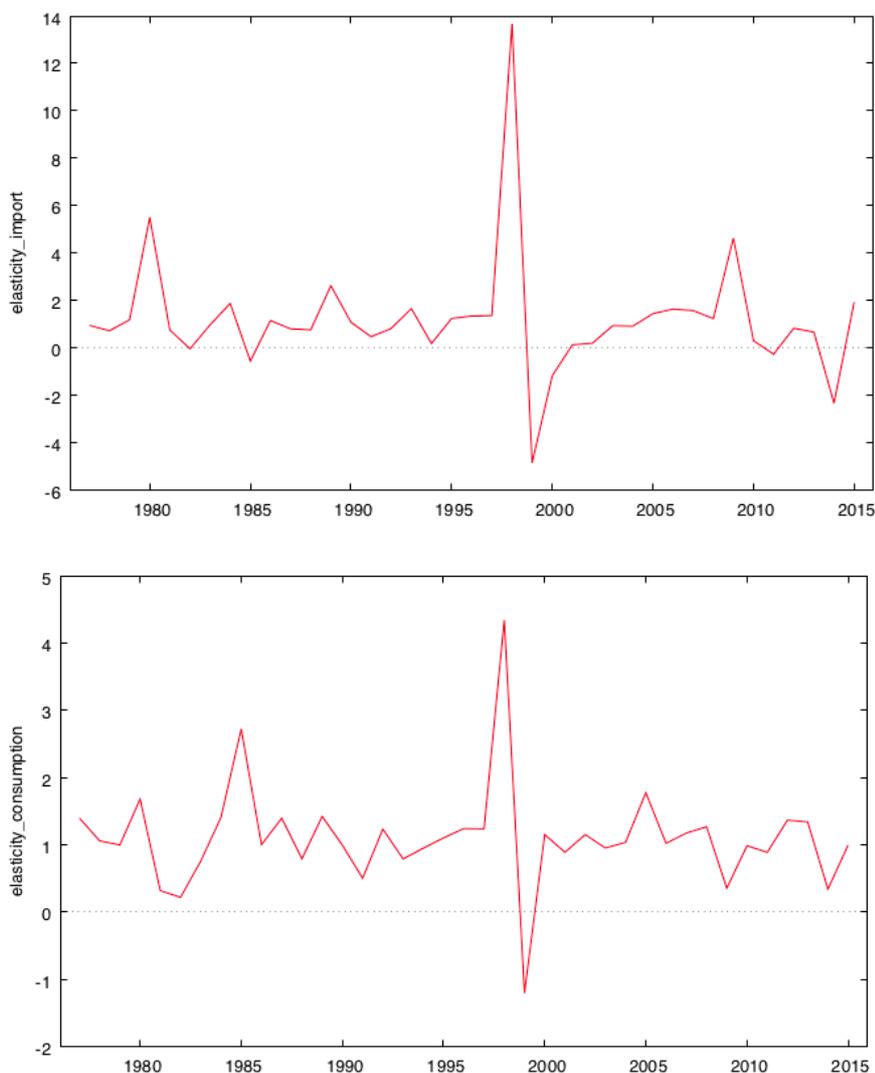
In short, public debt is considered to be sustainable when debt-to-GDP ratio does not increase (or decreases): this goal can be achieved when deficit-to-GDP is null or negative (interests on public debt included), as reminded by Pasinetti (1998). According to the SGP, this convergence should be achieved by countries in order to match their own MTO or at least guiding them by adjusting their structural budgeting position at a rate of 0.5% of GDP per year as a benchmark. Two kinds of MTO are allowed: the one is based on the preventive arm of the SGP (EU law), the other is based on the Fiscal Compact (intergovernmental treaty). While there is no specified upper limit when a country is maintaining a surplus, the lower limit is differently specified: 0.5% of deficit-to-GDP for Fiscal Compact, 1% of deficit-to-GDP for SGP. Moreover, the SGP introduced two instruments: *the preventive arm* of the SGP (i.e. “early warning” for countries not subject to excessive deficit procedure relying on personalized MTO) and *the corrective arm* of the SGP (i.e. excessive deficit procedure: a minimum 0.2% on GDP fine, triggered whenever conditions are violated, including a roadmap for structural reforms useful to correct excessive deficits). A critique mainly advanced by Angerer (2015) relies on the application of “effective action” in the special case of France in 2014, which has established a precedent for future assessment of effective action, since the Commission draft recommendation issued by the Council of the European Union (2015) referred to no assessment of an “effective action”. Indeed, exceptions to comply with rules have been allowed in case of systemic downturn of the EU as a whole. Another question raised by economists is about how much “fiscal space” would be allowed if interests on debt were not included (when low, higher fiscal space and by vice versa); this argument becomes critical when assessing cases of downturn as investments collapse and an exogenous shock (e.g. fiscal stimulus) could reboost the economy, while on the one hand investments could collapse in response to fiscal stimulus and on the other hand investments could collapse *per se* as an effect of demand depression (thus a policy making based on monetary expansion could give a momentaneous relief). Noting that important assumptions must be held, we will focus on the multiplier as an expression of market choices.

Dealing with an elaboration from several studies by Barrell et alii (2012), Gorodnichenko et alii (2012), Dolls et alii (2012), Ilzetzki et alii (2013), Batini et alii (2014), Coenen and Erceg et alii (2012b) we could state that the value of the Keynesian multiplier is affected by both *structural* and

*conjunctural* elements. Structural elements are: trade openness (higher multipliers for relatively closed economies), labor market rigidity (wage rigidity enhances output reactions to demand shocks, thus multiplier is increased), size of automatic stabilizers (the higher they are, the more fluctuations of multiplier are smoothed and the lower the multiplier is), exchange rate regime (fixed exchange rate regime increases multiplier, flexible exchange rate regime decreases multiplier), debt level (generally, the higher it is, the lower the multiplier is), public expenditure management and revenue administration (the more efficient, the higher the multiplier and the lower leakages are). Conjunctural elements are: state of the business cycle (during downturn multipliers tend to be larger than during upturns), degree of monetary accommodation to fiscal shocks (expansionary monetary policy can reduce depressing effects of a fiscal contraction on demand, but the ZLB assumption increases multiplier because of reduced crowding-out effect). Moreover, Delong and Summers (2012) argue that fiscal shocks during downturns could be more persistent on output because of the hysteresis phenomenon, while Christiano et alii (2011) remarked that implementation lags reduce multiplier at the ZLB; therefore, Erceg and Lindé (2010) noted that the more fiscal spending is discretionary and the more multiplier will be reduced. Batini et alii (2012) argue that multipliers tend to decay in a non-linear way.

We wanted to provide a particular sight on EU data, focusing on the market opportunities displayed by several Eurozone countries (France, Germany, Greece, Italy, Portugal, Spain), mostly focusing on imports and consumption as the main variables to describe multipliers; we filtered data from the World Bank database. The most interesting and unusual case is represented by Greece, which showed an abnormal behaviour of aggregates (in particular because it has been under pressure for fiscal contractions suggested by the IMF for reducing debt-to-GDP ratio, assuming a multiplier of 0.5). It is clear that IMF-backed policies expected a fiscal contraction to depress national income, but in the perspective of augmenting debt sustainability in order to recover future “fiscal space”. Such a multiplier suggested needs for privatization programme – as listed in IMF (2012) – of public owned goods (i.e. decrease of fiscal spending implied lower decrease of GDP). First of all, we reconstructed an ex-post multiplier’s historical series, which clearly depicted an increase of the multiplier during the 2009 downturn (we could consider even an approximation to average propensity for marginal propensity because of the robustness of modeling when considering constant-by-time average elasticities to income). We found out that distribution of the Greek multiplier (no taxes on income) has a non-Normal distribution (leptokurtic and positively skewed), therefore displaying signals of a unit root (which is deleted when considering multiplier including taxes on income, and this intuition finds support when dealing with automatic stabilizers). Nevertheless, Greece is the only country of our sample to show an unusual behaviour for propensity to consume, which has been discovered to be a *random walk*, both with (less likely) and without (more likely) trend. This finding is consistent to what Hall (1978) discovered about *random walks* of consumption during periods of uncertain incomes, as the historical series of Greek GDP shows. An Engle-Granger test (without constant) illustrated that both propensity to consume and propensity to imports have unit roots (no trend) and tests for unit roots on residuals did not find signs for unit root. In other words, there are very important factor to consider for “*co-integration*” between propensities. In fact, on average, propensity to consume is three times the propensity to imports. This conclusion would give insights of a structural fragility of Greek economy (in other terms, by considering the mechanism of “*investment accelerator*” to lower imports we would have projections of a gradually lowering multiplier).

**Figure 4.**



From the other viewpoint, when estimating elasticities to income of consumption and imports of Greece we have interesting results to support the non-linear case of multiplier: elasticity to income of consumption 1.09, elasticity to income of imports 1.20<sup>2</sup>. Figure 4 illustrates a historical series of elasticities.

Elasticities could be considered as stationary processes (no *random walk*), moreover their averages have been confirmed by a first-lagged moving-average process MA(1). The stationarity of elasticities is mostly due to the fact that elasticities could be equal to log-differences of first-lagged integrated ARIMA variables. In particular, Greek GDP graph reveals weak signs for unit root if trend is included in light of an ADF test, while a KPSS test with trend rejects hypothesis for unit root (Figure 5).

### Figure 5. Greece's GDP

<sup>2</sup> Hodrick-Prescott, simple moving-average and exponential moving-average filters on historical series of elasticities would even suggest amplified non-linear effects on Greek multiplier in relatively different ways, mainly because of an estimated higher elasticity to income of imports.



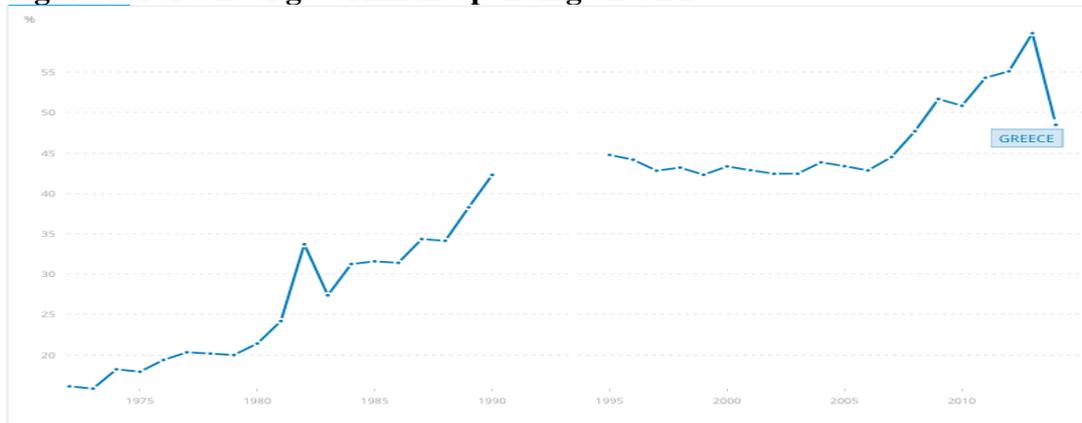
According to elasticities, during a downturn an increase of the multiplier is expected; moreover, an increase of propensity to consume could be due to augmentation of the Gini index during the last years (as shown by World Bank data). The Greek case showed several differences from high income countries (so we have some drawbacks to find similarities), which displayed no unit root for consumption and an increase of imports on GDP (so, unit root if trend is excluded, no unit root if trend is included), thus revealing the existence of non-linear behaviour of the Keynesian multiplier. As an ex-post analysis, we could see dynamics of Greek government expenditure-on-GDP ratio to increase (i.e. during “normal times” it represented a decrease of multiplier, while during the 2009 downturn it represented an augmentation of multiplier). In Figures 6 and 7, government spending is shown, respectively in level and as a ratio to GDP, to show the implementation of “*austere fiscal policy*”.

**Figure 6.**

GREECE GOVERNMENT SPENDING



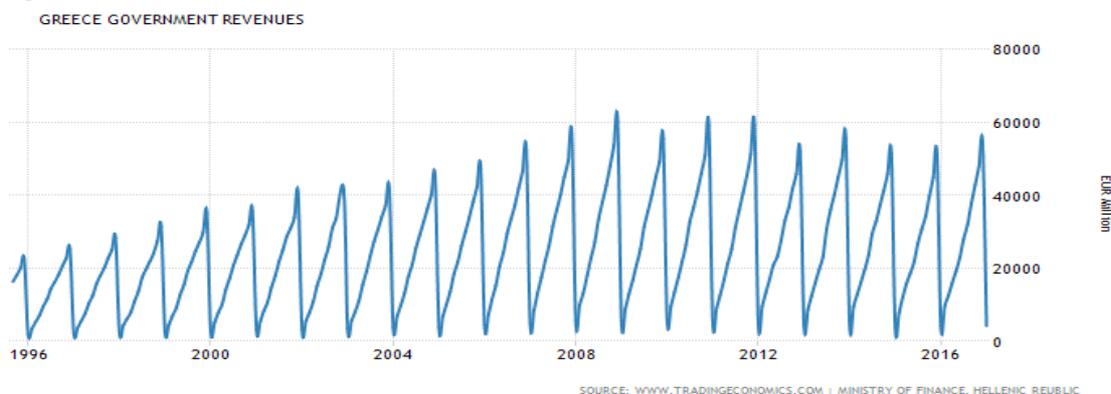
**Figure 7. Percent of government spending on GDP**



From the perspective of taxation, we have here another graph which illustrates that the Greek government has implemented a contractionary fiscal policy. Although it is difficult to determine how much of the taxation is exogenous or income-related because of a lack of information, a simplification is made by assuming all coefficients of different taxes to be equal.

Consider that data on government revenue are not shared by everyone, since other data (from World Bank database: GC.TAX.TOTL.GD.ZS last updated in 02/01/2017 where compulsory transfers such as fines, penalties, and most social security contributions are excluded, refunds and collection of erroneously collected taxes are negatively computed) tell another story, thus inducing to wonder about non-Keynesian setting for Greece. Officially recognized data on government revenues by the Ministry of Finance of Hellenic Republic are reported here (Figure 8).

**Figure 8.**



Although, a fiscal contraction has been implemented during the downturn in Greece to reduce the debt-to-GDP ratio: instead an increase of debt-to-GDP ratio has been found (Table 4). What could be alarming for this debt-to-GDP ratio is moreover the percent of debt (i.e. Greek treasury bonds) owned by foreign investors (indexed in euro currency), in addition to the fact that for developed countries a debt-to-GDP ratio is regarded to be high when trespassing the threshold of 100%:

**Table 4.**

Year	2010	2011	2012	2013
DEBT to GDP (%)	132.41%	111.13%	165.47%	181.66%

A crude proof of the kind of multiplier that has occurred in Greece could be provided by data from the EU Commission (i.e. a greater-than-one multiplier is desumed, and an increasing government spending on GDP ratio), which supports what Batini et alii (2014) argued when they found that a fiscal shock exhausts its effects on average within five years from its starting implementation (Table 5).

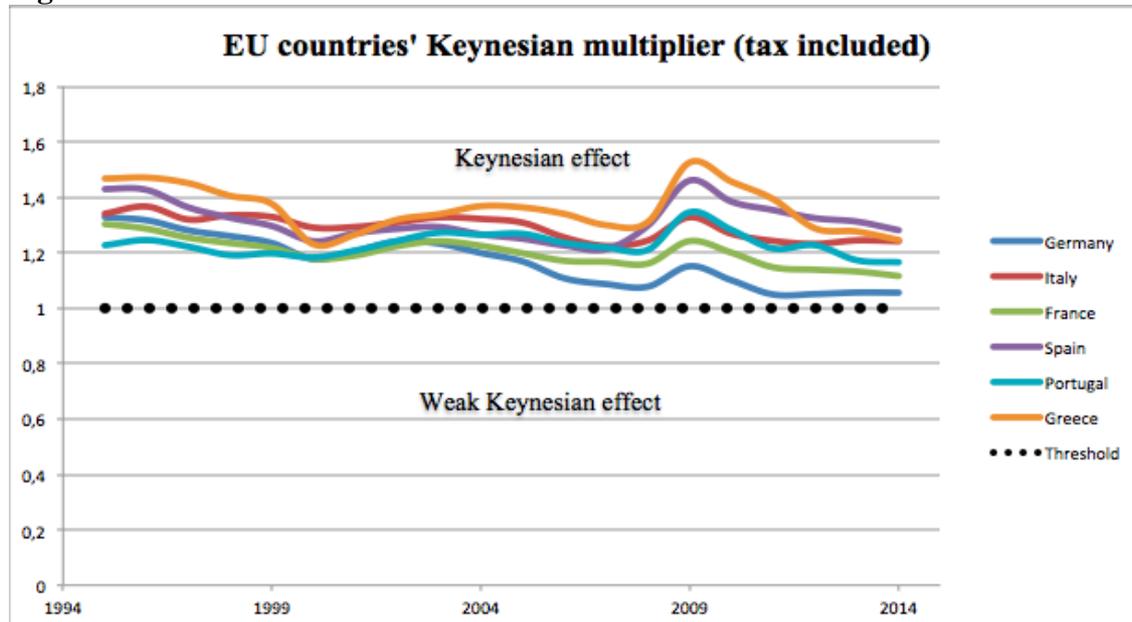
**Table 5.**

Aggregate/Periods	2008-2009	2015
Public Expenditure (without interests)	110 billions	81 billions
Gross Domestic Product	330 billions	207 billions

At the end, a graph represents estimated — by ex-post data — the Keynesian multipliers for several EU countries (data elaboration from World Bank databases and EU Commission data; Figure 9). Here we assumed marginal propensities equal to average propensities (indeed elasticities have a relatively high deviation in order not to reject this assumption, and GDP growth rates are relatively

low) since in a constant-by-time elasticity modeling the one could be regarded as a robust estimator of the other one (in particular the Greek multiplier in accordance to its average elasticities to income would be even higher during the 2009 downturn and its fluctuations would be wider), moreover we assumed an absence of crowding-out effects (in line with assumptions about the ZLB). Dealing with taxes, we had to make an important assumption to equalize all tax coefficients because of difficulty to find out tax multiplier.

**Figure 9.**



If looking at government spending stock levels, contractionary fiscal policies have been implemented by Greece, Portugal, Spain and Italy in the aftermath of the 2009 downturn, while France and Germany continued to regularly implement expansionary fiscal policies. As a result, the Eurozone GDP, as a whole, performed on an irregular growth pace.

## 7. Conclusions

In conclusion, there are elements to look at fiscal policy under a different perspective, even if we have to appreciate efforts and contributions from various doctrines and viewpoints. It is crucial to bear in mind differences between econometric techniques for projections and ex-post assessments (mainly based on alternative scenarios). According to this essay, during normal times the Keynesian multiplier's effectiveness is undermined, while during a downturn it soars. One of the most important arguments on why such differences have emerged stands on the fact that some theories examine results by SVAR methods (where the main problem could be an incomplete choice of variables to be implemented, or lacking consideration on exogenous important factors), which usually approximates coefficients to optimize likelihood functions. Generally, the average could be considered as a UMVUE estimator (especially for elasticities found out by a first-lagged moving-average process); intuition on increasing multiplier during downturn is confirmed when imports elasticity to income is greater than that of consumption (in coherence with our empirical data). We acknowledge that this essay represents a starting point for further studies on this matter. Where we could deepen several assumptions even for confutations, we are aware of the difficulty to find empirical data other than assumptions and estimations. It is interesting to note such different perspectives, which appear not to conciliate for several assumptions, but this should not undermine discussions and scientific research in either direction.

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