A Theoretical and Empirical Analysis of Public Expenditure and Taxation into Greek Economy

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Abstract: **The relationship between public expenditure, taxes and economic development has been extensively analyzed in literature with no consensus. This study adds to the literature as it divides public expenditure and taxes into different components to see their individual impact on economic development in case of Greece. Two types of regression models were estimated; in the first regression total public expenditure and taxes were used as fiscal tools while in the second model public expenditure and taxes were divided into different categories. The results show that taxes have negative effect while public expenditures have insignificant effect on development when considered in totality. However, current expenditures stimulate growth while capital expenditure has insignificant effect on growth. Indirect taxes impede development while direct taxes have insignificant effect. This suggests that development expenditures are not sufficient to put a significant impact on economic growth. Hence, there is dire need to increase developmental expenditures in Greece. Furthermore direct taxes should be focused more to increase revenue instead of indirect taxes.**

K*eywords:* **Public Expenditure, Taxation, Fiscal Sustainability, Economic Growth.**

Jel codes: H50, H21, H50, H71, H72

1. INTRODUCTION

There is a vast literature on how taxation distorts individuals' and firms' decisions concerning for example how much labor individuals supply, how hard they work, how and where investments are made, and where firms choose to locate. There is also a sizable literature documenting the overall effect of government size on economic growth. Though the results are scattered, recent literature tends to find that government size, typically measured as total government expenditures as a fraction of GDP, is negatively correlated with economic growth in rich economies (see e.g., Fölster & Henrekson (2001), Romero-Avila & Strauch (2008), and Bergh & Karlsson (2010)).

The reason government expenditures are thought to influence economic growth negatively is due to the distortionary effect of taxation. Studies analyzing the correlation rates it may be more fruitful to analyze the link between marginal tax rates and economic growth. An exception to the use of average tax revenue based measures is a study by Lee & Gordon (2005). They estimate the impact statutory corporate and personal income tax rates and the value added tax rate have on GDP per capita growth using panel data from in 70 countries. Of these taxes, they find that only corporate tax rates negatively and statistically significantly influence economic growth.

Given that intensified tax competition and increased demand for public services have made it more important to raise taxes in efficient ways there is surely more need for knowledge about how different types of taxes influence economic growth.1 This paper further examines the correlation between income taxation and economic growth by studying how taxation of corporate and top personal income impact economic growth in 25 rich OECD countries during the period 1975 to 2010.

Consistent with Lee & Gordon (2005) one can find robust support for corporate tax rates impacting growth negatively. However, one can find support for a non-linear relationship between tax rates and economic growth. Though it was also had been found a negative correlation between personal income taxes – both on incomes from labor and from dividends - and economic growth, this relationship is less between overall government expenditures and economic growth are, hence, using an indirect way to study how taxation affects economic growth. Several studies have analyzed the direct link between taxation of typically personal income and economic growth (see e.g., Koester & Kormendi (1989), Plosser (1992), Slemrod (1995), Padovano & Galli (2001) and (2002)). The results from this literature are equally scattered, however.

It is likely that not only the aggregated total tax burden but also the disaggregated structure of taxation matters for economic growth. Some taxes are thought to be more distortionary than others as different taxes have more or less stable tax bases. For instance, high corporate tax rates are often assumed to be more harmful for economic activities than taxation of property. Hence, various taxes have different effects on the level of economic activity. Whether this effect carries over to also impact the growth rate is less clear however.

A study by Easterly (1993) supports this by providing empirical evidence that distortions are negatively correlated with growth.

With tax competition countries worldwide are reforming their tax systems to become more competitive. In order to design desirable tax systems information about different taxes'harmfulness is of great importance. More recently studies have turned to investigate the structure of taxation and economic growth.

For instance, a few papers have examined the link between tax structure, based on tax measures from tax revenues, and economic growth (e.g., Widmalm (2001), Arnold (2008), and OECD (2010)). The results from these studies are mixed and, hence, hard to draw policy implications from. Moreover, a shortcoming of these studies is that they all use backward looking average tax measures based on tax revenues. As distortions from taxation to a large degree are influenced by forward looking marginal tax rates it may be more fruitful to analyze the link between marginal tax rates and economic growth. An exception to the use of average tax revenue based measures is a study by Lee & Gordon (2005). They estimate the impact statutory corporate and personal income tax rates and the value added tax rate have on GDP per capita growth using panel data from in 70 countries. Of these taxes, they find that only corporate tax rates negatively and statistically significantly influence economic growth.

2. PREVIOUS EMPIRICAL LITERATURE REVIEW

There is an extensive literature examining the relationship between government expenditures and economic growth. Many of these studies tend to find a negative relationship between size of government, typically measured as total government or government consumption expenditures, and economic growth (e.g., Barro (1991), Fölster & Henrekson (2001), (2006), Romero-Avila & Strauch (2008), Bergh & Karlsson (2010)), while others dispute this negative relationship (e.g., Ram (1986), Devaranjan et al. (1996), and Agell et al. (2006)) or are unable to demonstrate a statistically significant correlation (e.g., Kormendi & Meguire (1985), Levine & Renelt (1992), and Easterly & Rebelo (1993)).

The lack of consensus here may not be surprising as the overall size of the government has two contrasting effects. A larger size means higher taxes that impose larger distortions in the economy, but higher levels of public spending may also boost economic growth as part of the spending is growth enhancing While these papers look at government size as a proxy for overall level of taxation, several papers have tried to determine the direct link between taxation and growth. A majority of these focuses on how taxation of personal income affects economic growth and uses various measures to capture the tax burden of income taxation. The results from these studies are, if possible, even more scattered and found to be sensitive to use of tax measure and included variables.

For example, Plosser (1992), on the one hand, finds tax burdens measured as the share of revenues from income and profit taxes to GDP to be negatively correlated with GDP growth. Koester & Kormendi (1989), on the other hand, detect no statistically significant relationship between taxes and economic growth. They construct measures of average and marginal personal income tax rates by regressing tax revenues on GDP, and then use these measures in a growth regression. Neither tax rates seem to have a negative impact on the growth rate, though the marginal tax rate has a negative effect on the level of activity.

Padovano & Galli (2001) construct similar tax measures but include a slope dummy in addition to allow for changes in tax rates over time. Contrary to Koester & Kormendi, they observe these tax rates to negatively and statistically significantly impact growth. In a later paper, Padovano & Galli (2002), confirm the negative correlation between marginal tax rates and economic growth but find average taxes to have an insignificant impact Easterly & Rebelo (1993) detect, by using a wide set of different marginal income tax rates little evidence for a robust correlation between these marginal tax rates and economic growth in developing countries. An unstable or non-existing relationship is also in line with work from Mendoza, Milesi-Ferretti & Asea (1997), where tax rate variables turn insignificant in growth regressions when initial income is included, and Slemrod (1995) who demonstrates that the relationship between tax rates and growth is sensitive to specification and countries included.

Contrary to these findings are results from e.g., Leibfritz, Thornton & Bibbee's (1997) Who obtain a negative correlation between both average and marginal tax rates and economic growth, and Dowrick (1993) who find personal income taxes to have a negative effect on growth.

Some studies have analyzed the link between growth and the tax structure rather than the level of taxation. Kneller at al. (1999), for example, study the tax structure by dividing taxes into distortionary and non-distortionary taxes (measured as tax revenue as a share of GDP) and expenditures into productive and non-productive. Their results lend support to distortionary taxes reducing growth and productive spending enhancing growth. This result is later confirmed in a study by Gemell et al. (2006).

Turning to the literature including corporate tax rates, the literature becomes less extensive even though there are a growing number of studies showing interest in the overall structure of taxation and economic growth. While Dowrick (1993) found personal income taxes to have a negative impact on economic growth his results indicates no such relationship for corporate tax rates and economic growth. This is consistent with Widmalm's study (2001) that investigates the effect of tax structure, defined as the proportion of tax revenues stemming from taxes on personal income, corporate income, property taxes, taxes on goods and services, and taxes on wages, and a measure for tax progressivity on GDP growth. Her results reveal a negative correlation between the proportion of tax revenues from personal income taxes and economic growth, while no such correlation is found for the proportion of corporate tax revenues. This may seem surprising as the corporate tax rate is commonly thought to be more distortionary than taxation of personal income.

Arnold (2008) use annual panel data for 21 OECD countries to study the link between tax structure and economic growth. His tax measures are also based on tax revenues obtained from different taxes. Unlike previous studies Arnold use annual data and the estimations are based on a standard empirical model and a government budget constraint enabling evaluation of revenue-neutral changes in the tax structure. The results indicate that a stronger reliance on income taxes imply significantly lower levels of GDP per capita than the use of taxes on consumption and property. Among the income taxes, he finds corporate income taxes to be associated with lower levels of GDP per capita than personal income taxes.

In addition, Lee & Gordon (2005) analyze whether taxation of household versus corporate income differ in how they influence economic growth. Unlike above mentioned studies using tax revenue based tax measures, Lee & Gordon use top statutory tax rates on corporate and personal income to measure the tax effect. They do this on a sample of 70 countries during the time period 1970 to 1997. Results show a significant negative correlation between statutory corporate tax rates and growth but no significant correlation between top statutory personal income tax rates and growth. When they restrict the sample, by including an OECD-dummy, the corporate tax rate effect on growth for the OECD countries becomes nearly zero, suggesting that the corporate taxation is less harmful to growth in more developed countries than in less developed countries.

Above studies are all based on cross-sectional data for a number of different countries.

Engen & Skinner (1996) alert to the problems with cross-country studies and instead propose the use a bottom-up approach that estimates the effect of taxation on labor supply, investment, and productivity, respectively, and then sums these individual effects up to obtain the overall effect. Doing this suggest that both average and marginal tax rates hamper economic growth.

Several other papers have studied the impact of taxes on growth components. Schwellnus & Arnold (2008) and Vartia (2008), for example, study the impact of corporate income taxes on the productivity of firms and industries using a large data set of firms and industries across OECD countries. Both papers find a negative effect of corporate income taxes on productivity, and hence indirect evidence of corporate taxes harming growth.

Moreover, industry-level evidence from OECD countries (OECD, 2010) suggests a negative relationship between top marginal tax rates on personal income and long-run levels of total factor productivity, especially in countries with high entry level rates, suggesting that high top statutory personal income tax rates hurt firm entry. This is also consistent with results from Sweden, showing that high marginal tax rates on personal income retard firm start-ups (see Hansson (2010)). In addition, research by Gentry & Hubbard (2000) points to a negative relationship between the progressivity in the personal income tax schedule and entrepreneurial risk-taking.

Similarly, there is a sizable literature documenting a negative relationship between corporate tax rates and FDI (see e.g., De Mooij & Ederveen, 2006 and Feld & Heckemeyer, 2011). Several papers have established a negative link between labor taxes and FDI as well (Hajkova et al. (2006), Hansson & Olofsdotter (2011)). Hajkova et al. (2006) even find the impact of labor taxes on FDI to be substantially larger than that of cross-border effective average and marginal corporate tax rates.

After reviewing the literature, it seems fair to conclude that the empirical evidence of a relationship between both the level of taxation and the structure, respectively, and economic growth is weak, and that there is a need for further research to clarify this relationship.

Like Lee & Gordon (1995), our study analyzes how taxation of corporate and personal income impact economic growth. We also use marginal tax rates on corporate and personal income as our tax measures rather than measures based on tax revenues. Economic theory predicts marginal tax rates to matter for the distortions introduced to individuals' and firms' choices. This as they influence decisions concerning among others the amount of investments to undertake, additional income to earn, and entrepreneurial effort, and are, hence, the relevant tax rates for economic growth. Average tax rates, on the other hand, influence the discrete decisions whether to invest or work at all. Additionally, average rates are more correlated with government expenditures than marginal rates, and may hence effect economic growth positively, while marginal tax rates should, according to theory, be negatively correlated with growth. The difficulty lies in determining what marginal tax rate to use as different rates apply to different levels of income (due to various rates but also due to exemptions, credits, and depreciation allowances). To avoid some of these issues one could choose to use the top marginal tax rate on both personal and corporate income.

Unlike Lee & Gordon (2005) we focus on the rich OECD countries as the effect of taxation on economic growth likely vary greatly between rich and developing countries. In addition, we also study the effect of shareholders' taxation of dividends and employer paid social security contributions on economic growth. Whether social security contributions should be considered a tax or a fee for current and future benefits have been debated. If it is a tax it is likely to have the same impact as taxation of labor income. Either way, it is found it to be of interest to study whether social security contributions impact economic growth and if so to what extent. Another difference is that we allow for non-linearity in the tax effect. Up to a certain level tax rates may stimulate growth as the revenues generated are spent in productive ways enhancing the functioning of the economy. Above a certain level, the negative effects in terms of larger distortions caused by higher tax rates may outweigh the positive effects from spending the revenues.

3. A BRIEF REVIEW OF RECENT FISCAL DEVELOPMENTS IN GREECE

Rampant expenditure growth on the back of broadly irresponsible wage and hiring policies in the broader public sector conspired with untargeted social spending, widespread tax evasion and adverse demographics to result in a hugely unsustainable fiscal position in the period following the outbreak of the 2007/2008 global financial crisis. Greece's structural primary balance underwent a cumulative deterioration of more than 18.5ppts-of-GDP in 2001-2009, with the corresponding deficit reaching ca 14.5%-of-GDP at the end of that period. Notably, the bulk of the aforementioned deterioration can be attributed to an expansion of social spending (particularly, health and pension expenditures) by more than 6ppts of GDP.

In response to a further sharp rise in Greek sovereign bond spreads in late 2009 and during the first months of the following year, Greece signed in May 2010 a €110bn financing program with its Euro zone partners and the IMF (henceforth, 1st adjustment program),aiming to provide adequate government financing for the coming 2-3 years and to assist the country gradually reestablish access to international funding markets, starting in FY-2012. The aforementioned program came with strict conditionality that was laid out in a Memorandum of Understanding (MoU) agreed with official lenders. The three main strategic pillars of the 1st adjustment program were: (I) re-establish fiscal sustainability; (ii) reclaim competitiveness losses and facilitate a return to positive and sustainable medium-term economic growth; and (iii) safeguard stability of the domestic financial system.

Table 1.1 – Greece: General government revenues & expenditures compared to EU average
(in percent of GDP)

	2001	2008	2009	2010	2011	EU avg. 2008-10 1/
Revenue	40.9	40.7	38.0	39.5	41.0	44.3
Indirect taxes	13.3	12.4	11.3	12.0	12.7	12.8
Direct taxes	8.6	8.0	8.3	7.7	8.3	12.7
Social contributions	12.6	13.2	12.7	13.1	12.4	13.9
Non-tax and other	6.5	7.0	5.7	6.7	7.7	5
Total expenditure	45.3	50.6	53.8	50.2	50.3	49.6
Wages	10.4	12.0	13.4	12.1	12.0	10.9
Social benefits	15.4	19.6	21.1	20.8	21.6	20.7
Other current spending	7.3	8.1	8.9	7.7	6.7	11.1
Interest	6.5	5.1	5.1	5.8	6.9	2.7
Investment	5.8	5.7	5.2	3.9	3.1	4.3

1/ Averages for sub-categories of expenditure refer to the 2008-09 period.

Following a pretty strong start in the initial period after the signing of the 1st adjustment program, the reforms drive broadly stalled amid increasing social resistance to domestic austerity policies and heightened investor doubts over the ability of euro area governments and institutions to deal with the crisis. Responding to that difficult situation, and in effort to prevent a Greek sovereign default that could have severe consequences for the stability of the euro area as a whole, Greece and its official lenders signed in March 2012 a new bailout agreement (henceforth, 2nd adjustment program), covering the period 2012-2014. Under the new bailout, €130bn of new EFSF/IMF funding was earmarked for Greece so as to (i) implement a restructuring of privately-held Greek sovereign debt (total notional amount of PSI-eligible debt = €206bn); (ii) complete a €50bn domestic bank recapitalization plan; and (iii) cover the overall borrowing requirement for the period 2012-2014. Similarly to the 1st adjustment program, the 2nd program came with strong conditionality aiming to restore further the country's fiscal position, erase past competitiveness losses and stabilize domestic financial conditions. The 2nd program also incorporated certain important concessions (i.e., improved terms on official lending), including,

Among others, a lengthening of the maturities of (and a reduction in the interest rates on) old EU bilateral loans as well as new loans to Greece from the EFSF. As a prior action to the 2nd bailout agreement, the Greek Parliament voted in February 2012 an auxiliary budget (€3.2bn worth of expenditure-side measures), so as to facilitate fulfillment of the agreed fiscal targets for FY-2012. Furthermore, as part the conditionality underlying the new program, the Greek government committed to identify by the end of May 2012 a new austerity package for the period 2013-2014. Agreement between the Greek government and the EC/ECB/IMF troika on the new package was delayed due to the prolonged pre-election period in Greece, resulting in a considerable delay in the disbursement of a €31.3bn EFSF/IMF loan tranche that was originally planed for June 2012.

Following several rounds of painful negotiations and after broadly succeeding to bring the adjustment program back on track, Greece's new coalition government eventually reached agreement with the troika on a new fiscal package for the period 2013-2016, mainly consisting of expenditure cuts (Table 1.2)

The new package effectively implies a 2-year extension of the implementation horizon envisaged in the initial conditionality framework of the 2nd bailout agreement15 and follows an austerity program worth ca €49bn (22.5 ppts-of-GDP) applied in the period 2010-2012.

Out of the full package of new fiscal measures, the Greek Parliament approved in November 2012 the measures to be implemented in 2013-2014 (€13.5bn). Furthermore, additional measures (up to €4bn) for the period 2015-2016 are to be identified and agreed with the troika as a prior action to the 5th program review (August 2013). The implementation horizon of the new austerity program is heavily front-loaded with €9.2bn of measures implemented in FY-2013, mainly consisting of cuts in wages, pensions and special benefits (€6bn).

Table 1.2 – Package of new austerity measures 2013-2016/1
(Percent of GDP)

New Fiscal Measures	2013-14	2015-16
Expenditure Measures	5.10	0.04
Compensation of employees	0.79	0.01
Social Security transfers	3.23	0.04
Subsidies	0.09	0.01
Intermediate consumption	0.75	-0.01
Gross fixed capital formation	0.24	0.00
Revenue Measures	2.06	0.02
Direct taxes	0.90	0.01
Indirect taxes and sales	0.61	0.00
Social security contributions	0.38	0.00
Total	7.15	0.06
Memorandum item:		
Tax administration gains	0.34	1.30

Source: IMF staff estimates

1/ Fiscal measures introduced at the first review

Upon parliamentary endorsement of the new fiscal package, the 26/26 November 2012 Eurogroup announced a number of relief measures for Greece, aiming to bring the country's gross public debt ratio to 124%-of-GDP in FY-2020 (and to levels below 110%-of-GDP by 2022) and to cover most of the government borrowing gap indentified for the period 2013-2016.16 Furthermore, following the successful completion of a government debt buyback scheme, the Eurogroup of 13 December 2012 announced the unlocking of officialfunding to Greece, endorsing a €49.1bn cumulative EFSF disbursement over the period December 2012-March 2013 (€52.5bn includingthe IMF contribution).

As a final note to this section, the fiscal consolidation progress attained by Greece so far is quite impressive by historical standards, especially considering the overall size of output losses recorded in the last 5 years (cumulative real GDP contraction of nearly 20ppts since H2 2008). The general government primary deficit has been reduced from levels around 10.4%-of-GDP in FY-2009 to an estimated 1%-of-GDP in FY-2012, with the revised adjustment program now targeting a broadly balanced position this year (along with primary surpluses between 1.5%-of-GDP and 4.5%-of-GDP over the period 2014-2016). Despite this impressive progress, however, the primary balance still remains some way off its debt-stabilizing level (around +1.5%-of-GDP, according to our estimates), while a vigorous implementation of the new fiscal measures is required in order to facilitate fulfillment of the agreed fiscal targets

4. CONCLUDING REMARKS

In general, expansionary or contractionary shocks taking place in lower output regimes (economic downturns) appear to have much larger effects on output - both on impact and on a cumulative basis - than shocks of similar sign and size occurring in upper regimes (economic expansions).

In lower regimes in particular, the contractionary effects on output from a negative fiscal shock (spending cut or tax hike) rise with the absolute size of the shock. In the same vein, the expansionary effects on output from a positive fiscal shock (spending hike or tax cut) increase with the absolute size of the shock. Similar effects apply for fiscal shock taking place in an upper output regime, though to a much lesser extent.

Relative to the present fiscal adjustment program in Greece, our empirical results appear to support one of the main arguments made in our earlier paper on fiscal multipliers; namely that in favor of a more gradual implementation profile of the austerity program for 2013-2016. This is especially because, the new austerity program is heavily frontloaded, relying mainly on steep cuts in government expenditure items understood to have large fiscal multipliers e.g. wages and pensions.

By taking into account the main components of Greece's new fiscal program for the period 2013-2016 we derive some preliminary estimates regarding the recessionary impact (fiscal drag) of the new austerity measures on Greek GDP.

Specifically, it is suggested that cumulative GDP losses due to fiscal measures could range between €11.2bn and €19.6bn (or between 5.9 and 10.4 points of projected 2013 GDP) over a three years period. A note of caution: The latter results should be treated with extreme caution, not least because:

• Considerable uncertainty and diversion of views continue to exist as regards the macroeconomic effects of discretionary fiscal policy changes, both on theoretical and empirical grounds;

• Multiplier estimates tend to be not only regime- and type-of-shock-specific, but also estimation method-dependent;

• A relevant problem related to our empirical study is the lack of availability of a long-enough history of fiscal data for Greece i.e., one spanning an adequate number of economic expansions and downturn phases;

• An important finding of some recent empirical studies on the effects of fiscal policy is that multipliers tend to decline with the potency and intensity of market doubts over the sustainability of a country's fiscal position;

• The latter effective provides an important argument in favor of a more front-loaded fiscal austerity program in Greece;

• Yet there may be a significant number of other factors that may affect the shape and the magnitude of output responses to discretionary fiscal policy changes;

• One such factor is the degree of liquidity constrains facing households, with a number of recent studies documenting higher multipliers for economies in which a large share of domestic economic agents are liquidity constrained (as is the case in the current trajectory in Greece).

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