



**Thomas Moutos**

## **MoU and Traded Sector Development in Greece**

**Task 3.2.B**

### **Thematic Lot 1**

**DESIGN AND IMPLEMENTATION OF THE MEASURES  
TAKEN TO REORIENT THE ALLOCATION OF  
RESOURCES TOWARDS THE TRADABLE SECTOR**

**Contents**

1. Introduction	p.3
2. Taxation Developments	p.4
3. The Size of the Traded Sector	p.10
4. Tax increases and the size of the traded sector	p. 19
5. Could fiscal devaluation have worked?	p. 22
6. Concluding Remarks	p. 28
References	p. 30
Appendix: Computation of Effective Tax Rates	p. 33

## 1. Introduction

One of the stated objectives of the (first) Greek Adjustment Programme was to implement an ambitious structural reform agenda to strengthen external competitiveness, accelerate reallocation of resources from the non-tradable to the tradable sector, and foster growth. Structural reforms that would boost the economy's capacity to produce, to save and to export were deemed as critical for the success of the programme and recovery of the economy (European Economy, 2010, p 10). Moreover, in the same document it was stated that "...expenditure cuts equivalent to 7 percent of GDP will be implemented. Experience shows that expenditure-based consolidation has more chance of success, in particular for large consolidation efforts. These cuts and the respective release of resources for the private sector are also expected to contribute to restoring competitiveness in a medium-term perspective. Revenue increases were indispensable given the scale of consolidation efforts. Tax measures amount to 4 percent of GDP, but exclude increases in direct taxation and production costs as these would be detrimental to competitiveness" (p.14). The importance of tax evasion as a factor influencing budget consolidation was noted (i.e. "the authorities are implementing a number of measures to trim down tax evasion: despite being a crucial ingredient of the fiscal consolidation package, these measures are not taken in consideration in the programme fiscal projections for the sake of prudence; yields from anti-evasion measures are hard to quantify and materialise only over time" (p.14)), but its potential relevance in traded-sector adjustment was totally ignored.

The absence of any link between tax evasion and traded sector development was a feature of the Second Adjustment Programme as well. Indeed, tax evasion was deemed to be critical for the success of the programme "... not only because of the contribution to fiscal consolidation of additional receipts, but also because of the social acceptability of the adjustment programme as a whole. Indeed, there is a widely agreed perception that tax evasion, while pervasive, is graver among the most affluent" (European Economy, 2012, p.9). The report noted that "...tax and social security evasion may have actually increased in 2011, against the backdrop of negative economic growth and increased liquidity constraints of taxpayers" (p. 34), but again failed to notice any link between the persisting high (and increasing) rates of tax evasion, tax increases and the reallocation of resources toward the traded sector.

The small, and declining, size of the traded sector in Greece since euro area accession has been noted as a main weakness of the Greek economy, which could be corrected through the, cure-for-all, proposed structural reforms in the Economic Adjustment Programme (EAP) for Greece. However, no attention was paid to the possibly deleterious effects of fiscal consolidation on the allocation of economic activity between the traded and non-traded sectors.

In what follows we first look at the evolution of the tax burden in Greece, then at whether the hoped-for reallocation of economic activity towards the traded sector took place – it did not, then we examine various explanations for the failure to effect it, and finally look at how some form of fiscal devaluation was tried in Greece and its effects.

## 2. Spending and Taxation Developments

Figure 1 shows the evolution of (general) government revenue and primary expenditure in Greece and Portugal (data for Greece before 2006 were not available in the Ameco database). If we take the years 2008 and 2009 as the basis of comparison,<sup>1</sup> then, the Greek government had not managed to reduce its primary spending as a share of GDP by 2012, mainly due to the severe drop in GDP, but also due to bank-recapitalization expenses. Nevertheless the share of government expenditure did decrease between 2012 and 2014 by 4.4 p.p. (percentage points) of GDP, making the total drop between the average of 2008/2009 and 2014 equal to 2.9 p.p. of GDP. During the same period (i.e. 2008/2009 and 2014), the equivalent adjustment in Portugal involved a drop of just 1.1 p.p. of GDP. On the other hand, total government revenue increased by 7.4 p.p. of GDP from 2009 to 2014 in Greece, and by 3.2 p.p. of GDP in Portugal. A similar picture emerges if one looks at the tax burden (including imputed social security contributions): its share in GDP increased by 5.8 p.p. in Greece and by 3.3 p.p. in Portugal during the same period. On the basis of these measures it appears that budget consolidation in

Figure 1: Total Government Revenue, % GDP

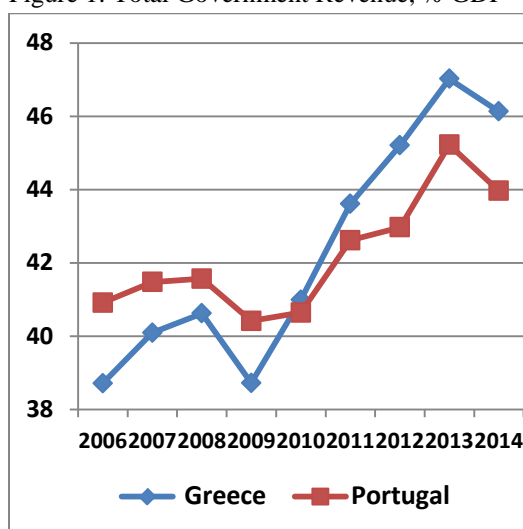
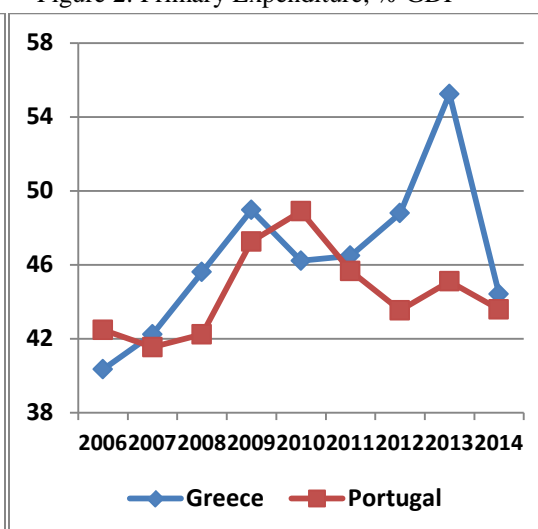


Figure 2: Primary Expenditure, % GDP



Source: Ameco

Note: The 2012 and 2013 expenditure data for Greece include the spending on bank recapitalization (2.7% and 10.4% of GDP, respectively).

<sup>1</sup> We use the average of the years 2008 and 2009 as the basis for comparison, since the 2009 data include expenditures which had not been previously accounted for.

Greece was larger on both sides of the budget, but it does not appear to have relied relatively more on tax increases than has been the case in Portugal.

However, a different conclusion emerges if we base our comparison on 2007, i.e. the year before the start of the global crisis. Then, government revenue (as a share of GDP) increased by 6 p.p. in Greece between 2007 and 2014, and by 2.5 p.p. in Portugal; the corresponding numbers for primary government spending are an *increase* of 2.2 p.p. for Greece, and 2.0 p.p. for Portugal.<sup>2</sup> By this reckoning, fiscal adjustment in Greece relied far more on tax increases than in Portugal.

Beyond the standard endogeneity problems (i.e. being dependent on the economic cycle), the above aggregate measures of the tax burden are not very informative about the burden imposed on different economic activities. In order to assess the effects of changes in different statutory tax rates, in the rules that determine the tax bases, and the various credits, we follow Mendoza, Razin, and Tesar (1994), and Papageorgiou, Efthimiadis, and Konstantakopoulou (2012) to calculate the so-called *effective* tax rates on factor incomes and consumption for Greece and Portugal.

Broadly speaking, the effective tax rates are estimated from information provided by the National Accounts as the ratios between the tax revenues from particular taxes and the corresponding tax bases. The data set consists of annual data, and covers the period from 2000 to 2012 (which is the last year for which the required data for calculating the effective tax rates are available). The data source is Eurostat. In the Appendix we provide the formulas used to calculate the various effective tax rates as well as the C-efficiency index, which is computed as the ratio of actual VAT revenues divided by the product of the VAT standard statutory tax rate and pre-tax value final consumption.

Figure 3 shows the evolution of the effective tax rate on personal income in Greece and Portugal. In both countries there has been a rise in the tax rate, but the rise was far more pronounced in Greece (from 8.7% in 2009, to 13.6% in 2012 – a rise of 56.3%) than in Portugal (from 10.0% in 2009, to 10.5% in 2012). The rise in the effective tax rate on personal income for Greece was matched by a rise in the effective tax rate on the labour income of employees (Figure 4), which went from 30.1% in 2009 to 37.9% in 2012; again, the rise of the corresponding tax rate in Portugal was far smaller as it went from 25.3% in 2009 to 26.8% in 2012.

---

<sup>2</sup> The increase in primary government spending (% of GDP) reflects not only the drop in GDP, but also the fact that the reduction in government employment and wages paid to government employees went in tandem with an increase in the number of pensioners - the number of pensioners increased by 0.4 million between 2008 and 2012 (a rise of nearly 20%) – and it did not allow for a reduction in government expenditure on pensions commensurate with the reduction in the average pension. This was mostly a result of the 2010 pension reform, other legislation that allowed the recognition of “notional” years, and employees’ fears of an increase in retirement age limits and a curtailment in severance pay (Giannitsis and Zografakis, 2015).

Figure 3: Effect. Tax Rate on Personal Income

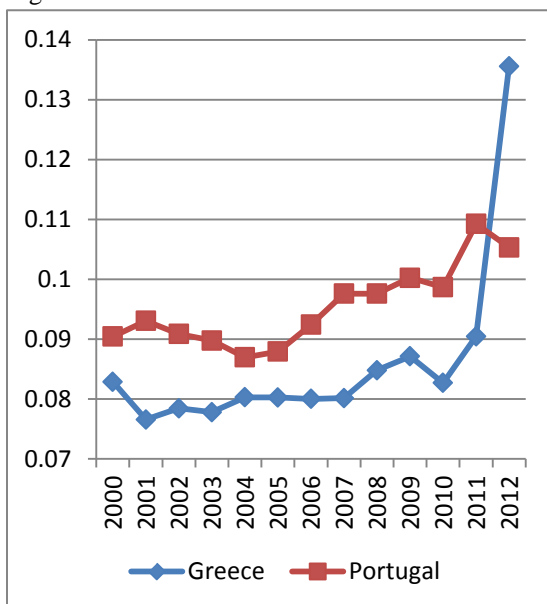
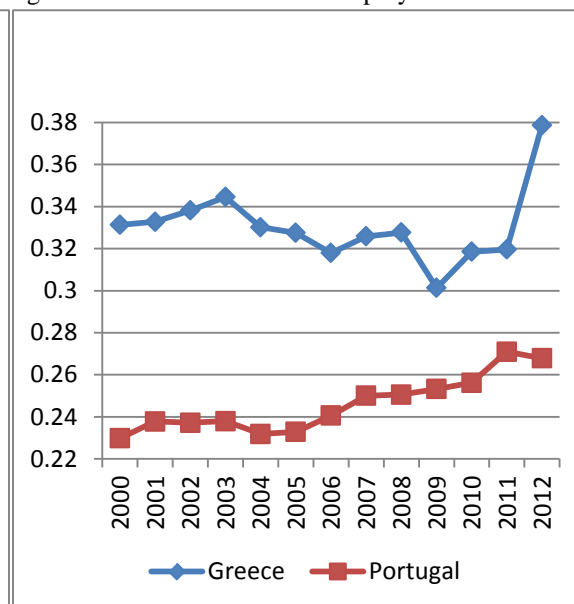


Figure 4: Effect. Tax Rate on Employee Labour Income



Source: Eurostat and own calculations

The far larger rise in effective tax rates in Greece vis-à-vis Portugal is also evident for the tax rate on capital, which, between 2009 and 2012, increased by 5.4 p.p. in Greece and by 0.8 p.p. in Portugal (Figure 5). In contrast, during the same period, the effective tax rate on consumption (Figure 4) increased to a similar extent in both countries, i.e. by 2.7 p.p. in Greece and by 2.3 p.p. in Portugal.

Figure 5: Effect. Tax Rate on Consumption

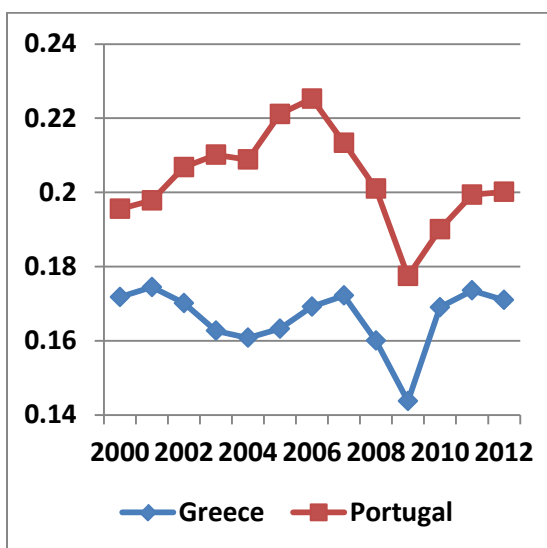
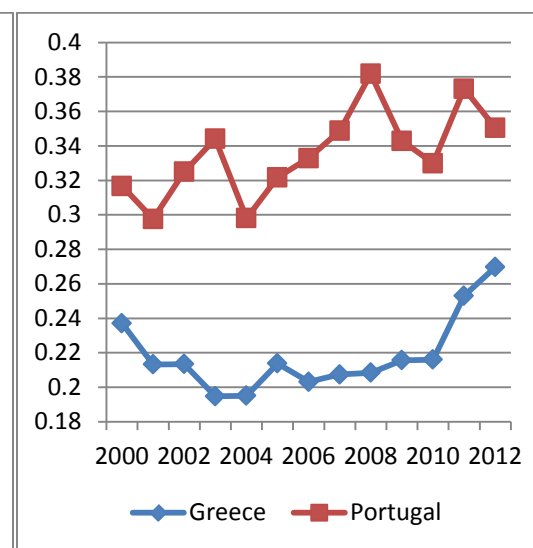


Figure 6: Effect. Tax Rate on Capital



Source: Eurostat and own calculations

The rise, between 2009 and 2012, in the effective tax rate on self-employed labour income was larger in Greece than in Portugal (Figure 6). It rose by 3.6 p.p. in Greece bringing it to 18.9% in 2012, and by 0.4 p.p. in Portugal (13.9% in 2012). Nevertheless, in both countries, the effective tax rates on self-employed labour income remained far below the corresponding tax rate for dependent employees. In 2012 the difference between the effective tax rate on the labour income of dependent employees and the corresponding one for the self-employed was 18.9 p.p. in Greece, up from a difference of 14.8 p.p. in 2009; the corresponding differences for Portugal were 12.9 p.p. in 2012, and 11.8 p.p. in 2009. We note that for the rest of the euro area the effective tax rates for labour income did not differ much between dependent employees and the self-employed; their average values over the 2000-2009 period were 34% and 29% (respectively), thus their difference was only 5 p.p. (see Papageorgiou, Efthimiadis, and Konstantakopoulou, 2012). These large differences in the effective tax rate on labour income between the dependent employees and the self-employed are associated with widespread tax evasion and potentially explains the far larger share of self-employment persons in both countries (in 2013 the shares were 32% for Greece and 21% for Portugal) than is the average for the euro area (14.3% for the EA19 in 2013).

Figure 7: Effect. Tax Rate on Self-Employed Labour Income

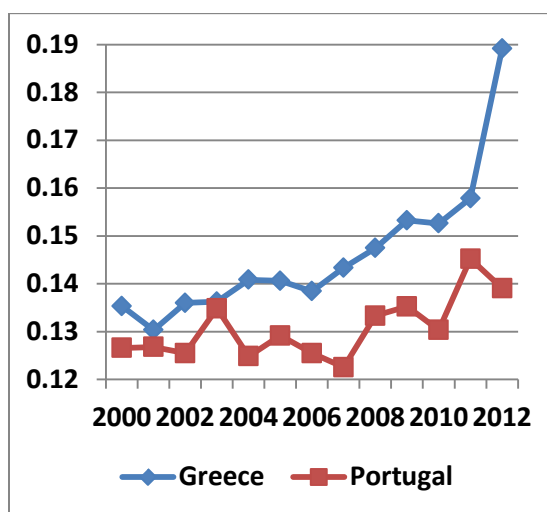
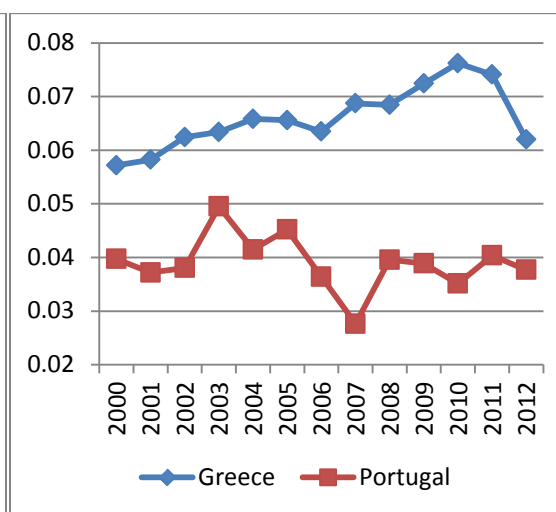


Figure 8: Effect. Tax Rate on Soc. Security Contributions of the Self-employed

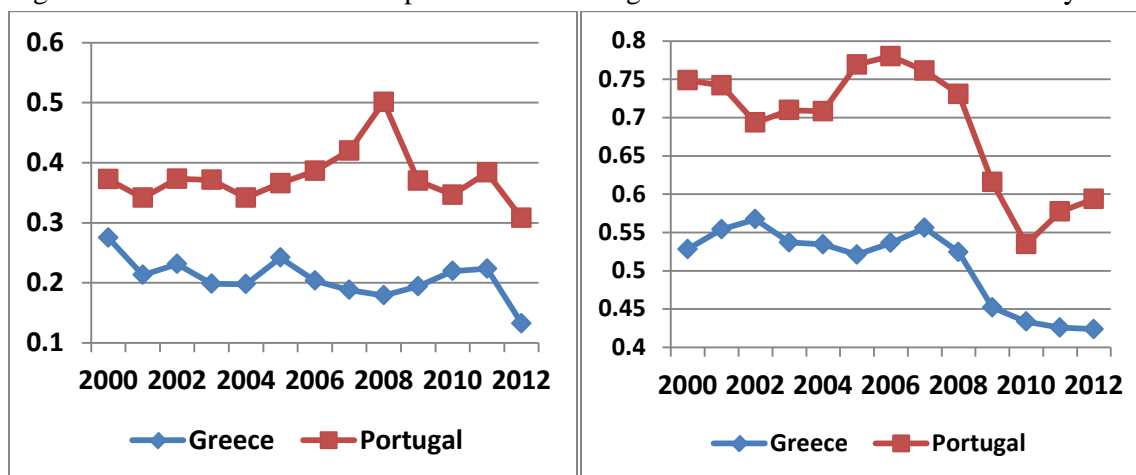


Source: Eurostat and own calculations

The effective tax rate on corporate income dropped in both countries between 2009 and 2012, and in 2012 stood at its lowest level since 2000 (Figure 9). The drop between 2009 and 2012 was similar in both countries – about 6.2 p.p., but the effective tax rate remained in 2012 far higher in Portugal (30.8%) than in Greece (13.2%). Note also that the average for the EA12 over the 2000-2008 period was 24% (Papageorgiou,

Efthimiadis, and Konstantakopoulou, 2012). The very low effective corporate income tax rate in Greece - despite the fact that the nominal corporate income tax rate was close to the EA12 average – reflects not only the intricacies of the tax law (e.g. exemptions) but widespread tax evasion.

Figure 9: Effect. Tax Rate on Corporate Income      Figure 10: VAT Collection Efficiency Ratio



Source: Eurostat and own calculations

Figure 10 displays the so-called C-efficiency index, which is computed as the ratio of actual VAT revenues divided by the product of the VAT standard statutory tax rate and the pre-tax value of final consumption. This is different from the traditional measure of the effectiveness of the VAT in raising revenue, i.e. the "efficiency ratio", which is the ratio of VAT revenue to GDP, divided by the standard VAT rate. A problem with the "efficiency ratio" is that the appropriate benchmark should be total consumption (the ideal VAT base), not GDP. The C-efficiency index avoids this problem by measuring instead the ratio of VAT revenue to consumption, divided by the standard tax rate; a VAT that taxed all consumption at a uniform rate and there was no VAT-evasion would have a C-efficiency index of 1.<sup>3</sup> We observe that Greece has had a far lower C-efficiency index than Portugal - from 2000 to 2008 the average value of the index was 0.54 for Greece and 0.74 for Portugal. Since 2008 there has been a significant deterioration in C-efficiency for both countries. This is understandable since for both countries there has been a decline in the value of imports (as a share of GDP as well), and it is well known (Keen, 2013) that

<sup>3</sup> This measure has three important advantages. First, it is easy to calculate from readily available data. Second, it provides a clearly understandable normative benchmark – a uniform VAT imposed on all final consumption. Third, as Keen (2013) discusses in detail, the gap between actual and 'potential' revenues thus measured may be decomposed in a number of useful ways. Such decomposition is important because while the C-efficiency index is a good starting point, it is not in itself adequate to assess the separate influence of VAT compliance or administrative effort.



the C-efficiency index depends positively on the import ratio since it is relatively easier to ascertain VAT obligations at the point of entry into the country than domestically.

However, the C-efficiency index as a gauge of how much extra VAT revenue could be raised if all VAT rates moved up to the standard rate has some problems. First, it assumes that moving to the standard tax rate would not affect either the level or composition of consumption, which is unlikely (Alm and El-Ganainy, 2013). Second, it assumes that “consumption” as defined in the national accounts is the same as the aggregate tax base that would be subject to such an ideal comprehensive VAT rate. As OECD (2012) shows, however, in principle a number of adjustments to national accounts data are needed to estimate something closer to the real base of the VAT because final consumption as reported in the accounts includes some items that are not subject to VAT and excludes some items that are subject to VAT. Third, it assumes that moving up to the uniform VAT rate would not alter the incentives for tax evasion.

We note that the C-efficiency index is not based on the assumption of perfect compliance. Instead, it combines a measure of what may be called ‘policy efficiency’ – the extent to which the different statutory tax rates imposed generate revenue approximating that which would be collected by a tax imposed at the standard VAT rate from an idealized base with perfect compliance– and ‘compliance efficiency’ – the extent to which the tax actually assessed differs from what would be assessed if there was perfect compliance with the law.

We can thus think of an alternative measure to C-efficiency, the VAT GAP, which can be decomposed into what may be called the *compliance gap* and the *policy gap*. The VAT GAP is measured as the difference between the theoretical tax liability according to the tax law and the actual VAT revenue collected (ACT VAT REV). The theoretical tax liability (THEO VAT REV) is calculated as the total amount of estimated VAT payments on the basis of national accounts aggregates, input-output tables, and the existing structure of rates and exemptions. Keen (2013) calculated that in 2006 the policy gap among the EU15 was always greater than the estimated compliance gap and, for most countries, much larger. The main exception to this finding was Greece, which had by far the largest compliance gap (equal to 30) – almost as large as its (residual) policy gap (equal to 33). For Portugal, the compliance gap was only 4 and the policy gap was 45. Interestingly, while Greece had by far the largest compliance gap, its policy gap was below average, while Portugal’s policy gap was the highest. Keen (2013) has also decomposed the policy gap further into rate and exemption gaps, with the exemption gap in Greece being the lowest (along with Spain).

We note that according to calculations by CPB (2013) which took into account the various VAT rates (not just the standard one) and the input-output data of the WIOD , from 2008 to 2011 the difference between the THEO VAT REV and ACT VAT REV

(i.e. the compliance gap) grew from €7.1 billion to €9.8 billion in Greece, despite a small increase in THEO VAT REV from €24.1 to €24.8 billion, thus increasing the compliance gap from 29% in 2008 to 39% in 2011. The corresponding gap in Portugal increased from 9% in 2008 to 16% in 2011. As a share of GDP, the compliance gap grew in Greece from 3.0% in 2008 to 4.7% in 2011; for Portugal, from 0.8% to 1.6%.<sup>4</sup> It thus appears that for Greece closing the VAT compliance gap is a far greater priority than closing the (rather small) policy gap.

### 3. The Size of the Traded Sector

The definition of the traded sector is not straightforward. An obvious benchmark for tradability is the extent to which a particular good is actually traded internationally. This benchmark implicitly underlies the shortcut adopted in most empirical work of labeling manufactures as tradables and services as non-tradables.<sup>5</sup> While historically quite accurate, the globalization of service markets casts doubts on the continued validity of this simple dichotomy. Moreover, adopting this dichotomy would render tourism and shipping as non-traded sectors, something which would be odd in the Greek case given the ability of these sectors to generate substantial revenue from abroad. For this reason, and following De Gregorio, Giovannini, and Wolf (1994), and most of the subsequent empirical literature, we use the extent to which a good or a service is actually internationally traded as a proxy for its tradability. Piton (2015) has recently reassessed the tradability of goods, but also of seven different services sectors, by calculating the ratio of total exports of the EA10 to total production of the EA10 – which we may call *tradability ratio*, and has termed a sector as tradable if the average of the tradability ratio for the period 2000-2012 is higher than 0.2. According to her calculations, the tradability ratio for “industry (except construction, sewerage, waste management and remediation activities)” was 3.34, and then it dropped to 0.5 for “professional, scientific and technical activities; administrative and support service activities”, to 0.43 for “wholesale and retail trade, transport, accommodation and food service activities”, to 0.36 for “agriculture, forestry and fishing”, to 0.26 for “information and communication”.<sup>6</sup> In what follows we shall include the above activities in the traded sector, but we shall also comment on variations of this definition. The tradability ratios for the rest of the activities, which we shall classify as non-traded, are: 0.18 for “financial and insurance activities”; 0.08 for “arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies”; 0.07 for “construction”; 0.01 for “public administration, defense, education, human health and social work activities”; and, 0.00 for “real estate activities”.

---

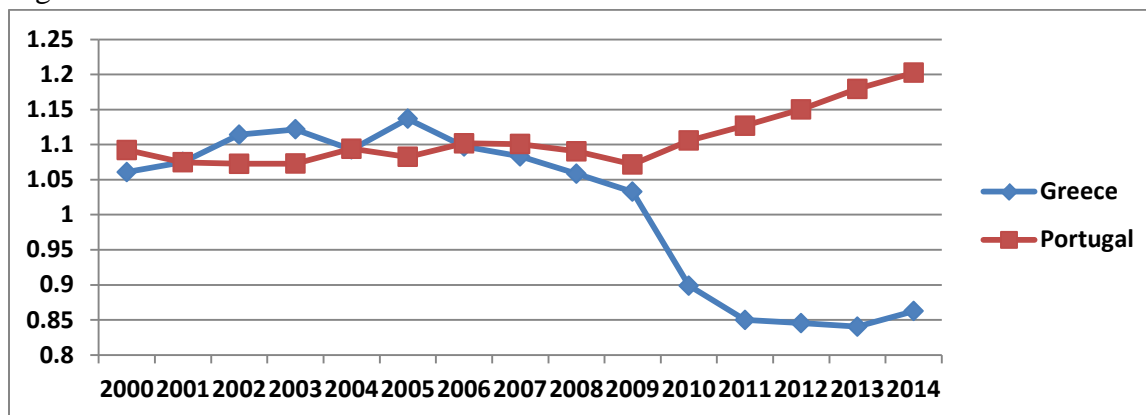
<sup>4</sup> The rise in the compliance gap can be understood as a response to the rise in the VAT rates in both countries since 2009.

<sup>5</sup> ECB (2006) uses manufacturing as a first-order approximation for the tradable sector.

<sup>6</sup> The sectoral nomenclature corresponds to NACE\_R2.

In Figure 11 we depict the relative evolution of the (real) Gross Value Added (GVA) of the tradable sector relative to the non-tradable sector since 2000, by following the above categorization of traded goods. Greece's and Portugal's ratio of traded to non-traded GVA were, on average, the same from 2000 to 2008, both being equal to 1.09. However, since 2009 there has been a large divergence, with Portugal's rising gradually from 1.07 in 2009 to 1.20 in 2014, whereas Greece's tanked from 1.03 to 0.86 from 2009 to 2014. We note that most of the deterioration took place between 2009 and 2010, which can be

Figure 11: Ratio of Tradable to Non-Tradable Gross Value Added



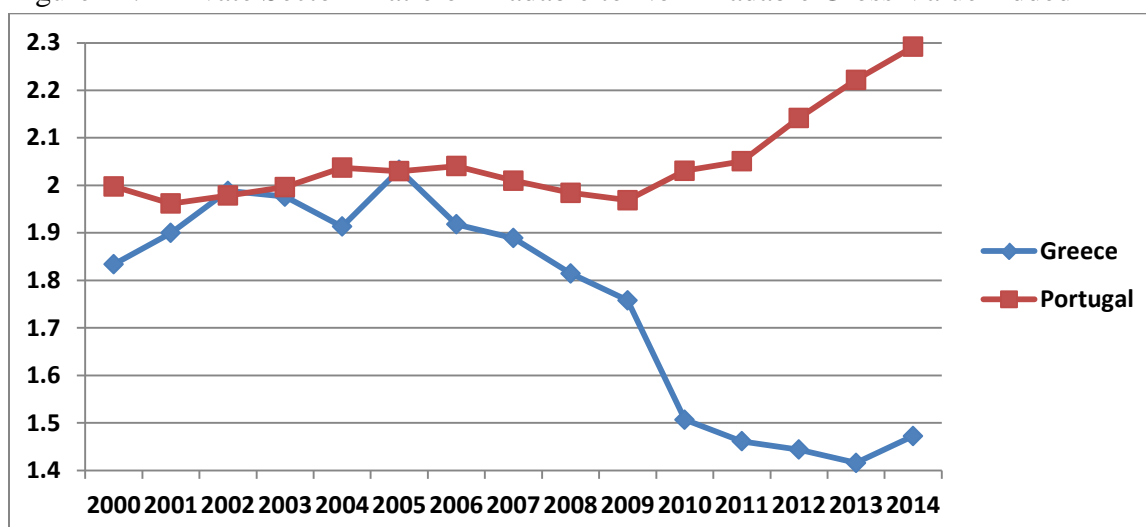
Source: Eurostat and own calculations

explained as the result of two factors: first, the impact of the collapse of world trade (which started in 2008) on sea transport, and the delayed response of government spending to the crisis. In any case, even if one takes 2010 as the year when a deliberate effort at adjustment was undertaken, the difference with Portugal remains striking.

Could the differential evolution in the relative size of the traded sector in Greece and Portugal be due to the way the traded sector has been defined? In Figures 12, 13, and 14 we show that this is not the case. In Figure 12 we show the ratio of traded to non-traded GVA if we exclude from the non-traded sector the activities related to the operation of the public sector, i.e. if we focus on the allocation of economic activity of the “private sector” by excluding “public administration, defense, education, human health and social work activities” from the non-traded sector. We note that the collapse of the share of traded sector GVA in Greece is similar (in percentage terms) to the one displayed in Figure 11. The same picture emerges for Figure 13, which classifies “financial and insurance activities” as part of the traded sector.<sup>7</sup> Moreover, the proportional drop in the ratio is larger in this case for Greece than in other cases examined.

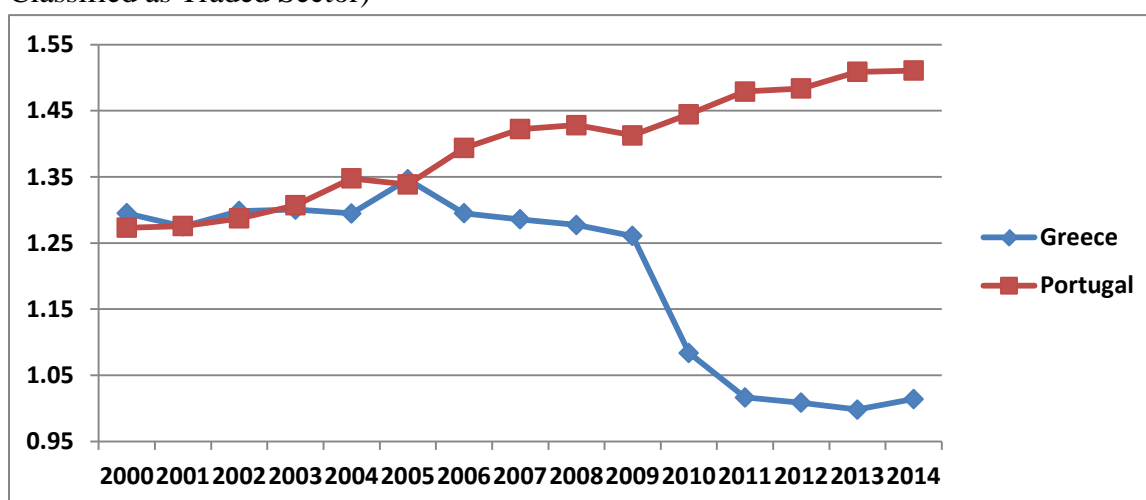
<sup>7</sup> Financial and insurance activities can arguably be classified as a traded-sector activity; e.g. Jensen and Kletzer (2005) and Gervais and Jensen (2013) show that financial and insurance activities are very

Figure 12: “Private Sector” Ratio of Tradable to Non-Tradable Gross Value Added



Source: Eurostat and own calculations

Figure 13: Ratio of Tradable to Non-Tradable Gross Value Added (Finance &amp; Insurance Classified as Traded Sector)



Source: Eurostat and own calculations

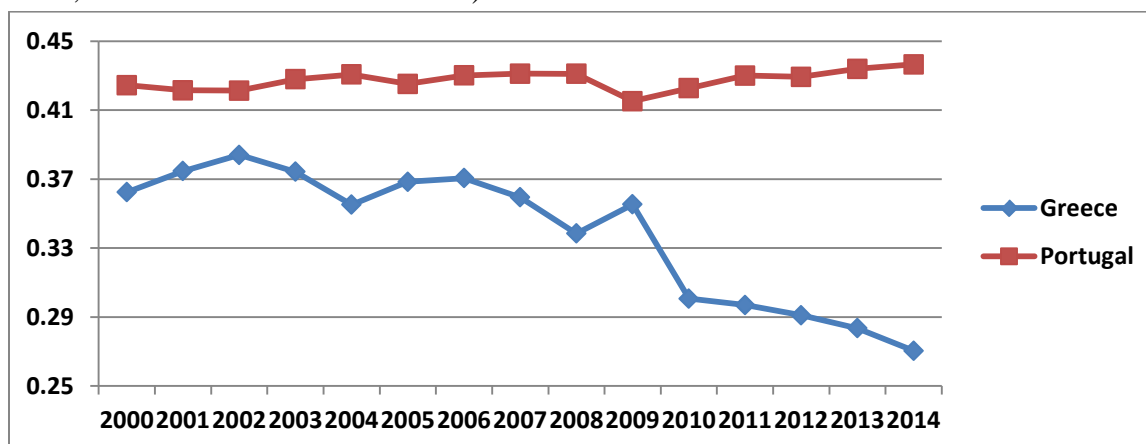
In Figure 14 we exclude “wholesale and retail trade, transport, accommodation and food service activities” from the definition of tradables, and include it in non-tradables. This is done in order to capture the fact that many of these activities are undeniably non-tradable in nature and hot-beds of tax evasion. We see that the decline in the share of tradables is stronger in this case; moreover, unlike the previous measures which displayed a small reversal of the decline of the relative size of the traded sector from 2013 to 2014, in this case the decline proceeds unabated. Finally, we note that if we look at the traditional

---

heterogeneous and contain both tradable and non-tradable activities. These authors use the geographical concentration of activity as a proxy for tradability.

industry-to-services ratio, the decline in the ratio would continue up to 2014 for Greece (while it would increase for Portugal).

Figure 14: Ratio of Tradables to Non-Tradables Gross Value Added (wholesale and retail trade, etc classified as non-tradables)



Source: Eurostat and own calculations

Another split between tradables and non-tradables which we have tried is to exclude “real estate activities” from the definition of non-tradables. We have done this since “real estate activities” is the only sector in Greece which has registered a rise in (real) GVA between 2009 and 2014 (by 11%), and we wonder whether this is a statistical artefact.<sup>8</sup> We find that still our conclusion holds, i.e. there was a decline in the ratio of traded to non-traded GVA between 2009 and 2014 (from 1.48 to 1.41), although the decline was not as strong as in the figures described above.

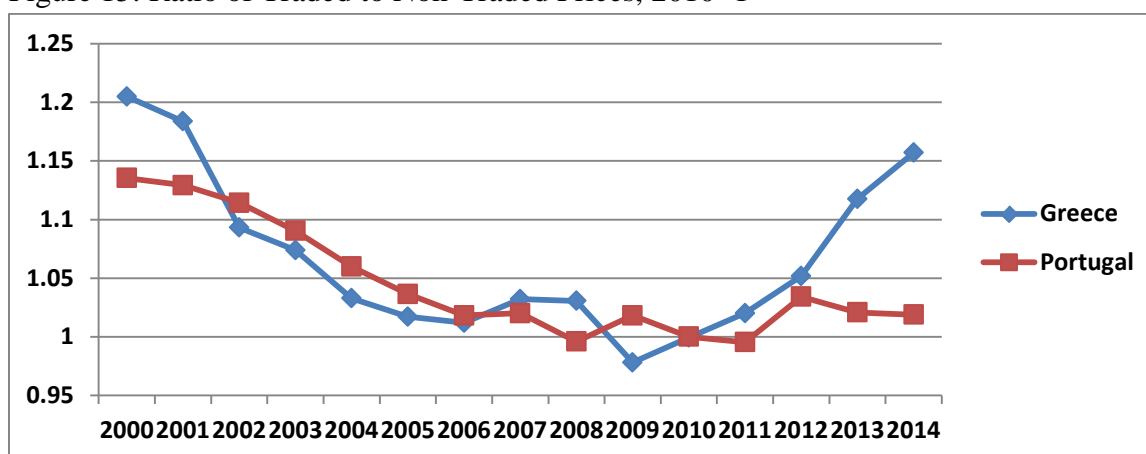
A final concern regarding whether our measures portray the true developments regarding the allocation of resources between the traded and non-traded sectors concerns the activities of the “water transport” sector. This sector is naturally included in the definition of tradables, but the evolution of its GVA is not tied much to developments in the domestic economy, but depends on trends in international trade. (Moreover, most of the production costs are independent of domestic wage developments as the service is produced offshore, it employs a large share of non-Greek seamen, and relies for a large part of its financial needs on international banks.) Could developments of this sector cloud our picture about a shrinking traded sector? Unfortunately, the available data (Eurostat) for the GVA of “water transport” cover only the 2008-2012 period, and portray only nominal GVA generated by – one suspects – fleet under the Greek flag, and not Greek-owned fleet. It is true that the “price” of water transport services has declined – the

<sup>8</sup> An explanation for the rise in the recorded GVA of “real estate activities” is that taxpayers became more willing to declare rental incomes due to increased monitoring activities by the tax authorities.

Baltic Dry Index collapsed by more than 80% between 2009 and 2014, but the “volume” of services produced has probably not declined to any significant extent since the volume of international trade was higher in 2014 than in 2009. We thus conclude that the inclusion of “water transport” into tradables is not likely to have diminished the (real) GVA attributed to the traded sector, and that our findings regarding the maladjustment of the Greek economy does not depend on our definition of tradables.

The drop in the share of GVA generated by the traded sector in Greece coincided with a significant rise in the relative price of traded goods since 2009, whereas the rise in the share of GVA generated by the traded sector in Portugal was not followed by any rise in the relative price of traded goods. Before presenting our explanation for the (paradoxical) rise in the relative size of the non-traded sector in Greece despite the fall in the relative price of non-traded goods, it’s worth noting that the overall behaviour of traded goods prices has not been very dissimilar in Greece and Portugal (Figure 15); although the price trajectory for Portugal involved some decline (2.5%) between 2009 and 2011, by 2014, the cumulative differential rise in traded goods prices between Greece and Portugal relative to 2009 was 2.6 p.p. (i.e., they rose by 3.2% in Greece, and by 0.6% in Portugal). As one would expect (given the size of the recession), non-traded prices dropped considerably in Greece (a cumulative drop of 12.9%) between 2009 and 2014, but remained intact in Portugal (a rise of 0.5%). It, thus, seems that the rise in the relative price of traded goods in Greece was achieved mostly as a result of downward adjustment of non-traded prices. It bears noting that among the activities comprising the traded sector in Greece, “industry (except construction)” registered the, by far, largest increase in prices between 2009 and 2014 – by 14.5%; in contrast, “industry (except construction)” in Portugal registered a *decline* in prices by 1.5%. The hoped-for international adjustment of traded prices vis-à-vis the rest of the world has not materialized in Greece so far.

Figure 15: Ratio of Traded to Non-Traded Prices, 2010=1



Source: Eurostat and own calculations

Figure 16: Prices of Non-Tradables, 2010=100

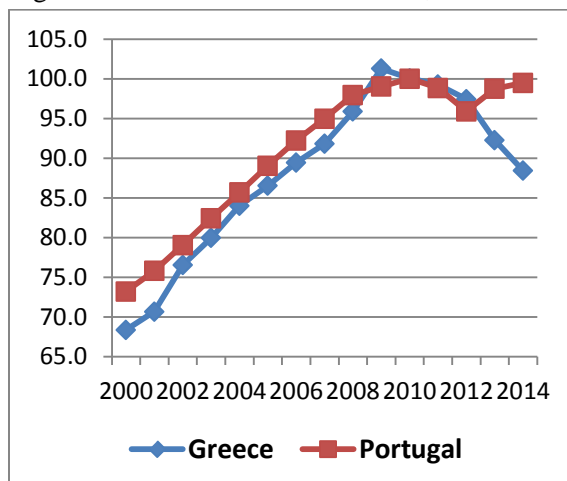
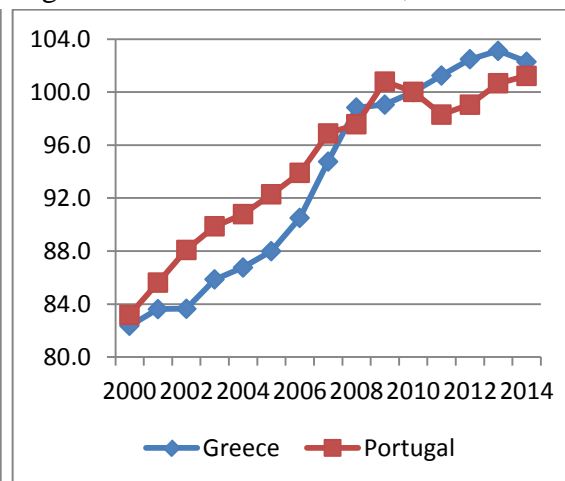
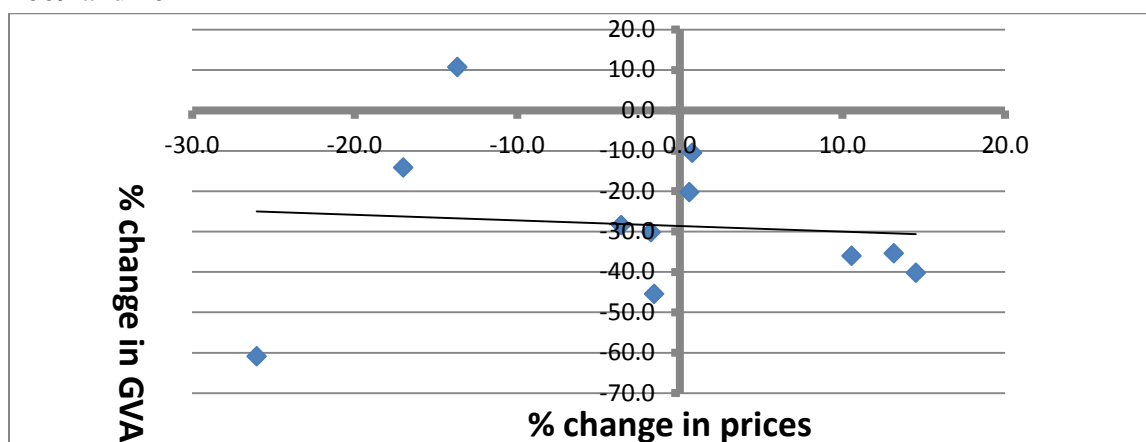


Figure 17: Prices of Tradables, 2010=100



Source: Eurostat and own calculations

Figure 18: Greece: Cumulative percentage change in GVA and producer prices between 2009 and 2014

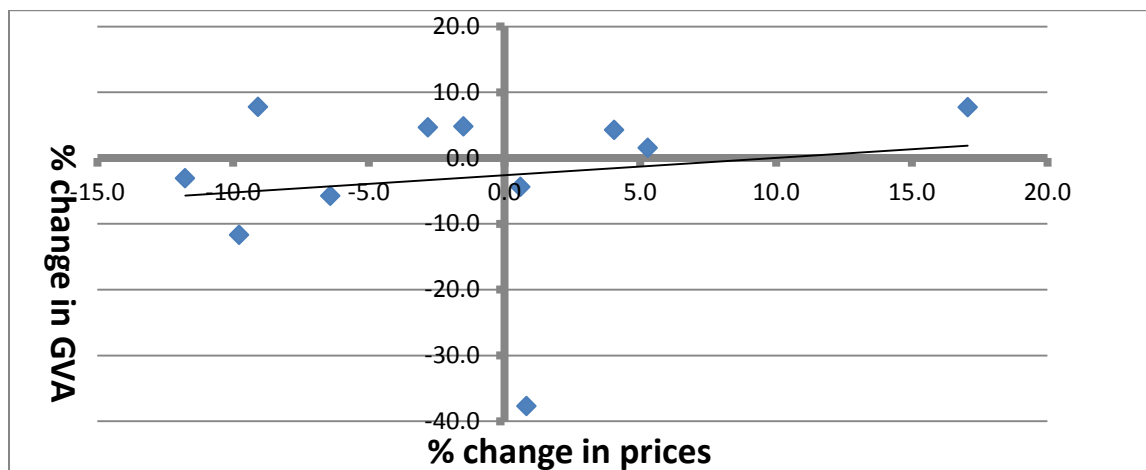


Source: Eurostat and own calculations

What is perhaps more revealing regarding the maladjustment of the Greek economy is displayed in Figures 18 and 19, which show the correlation between the cumulative change in the prices of various activities between 2009 and 2014, and the cumulative change in the (volume) of GVA during the same period. For Greece, the correlation is negative – and especially strong if “construction” is ignored (the bottom-left outlier in the figure), whereas for Portugal the correlation is positive. A possible explanation for the negative correlation between the relative price of traded goods and the relative size of the traded sector is that productivity growth was faster in the traded sector – the so-called Balassa-Samuelson effect. However, there is no evidence for faster productivity growth in the traded sector since 2009. Although no sectoral measures for TFP growth are

available since 2009 for Greece, if we take as its (rather imperfect) proxy the development of GVA per employee across activities, the data reveal that labour productivity growth (which was negative in some cases) was higher in the non-traded sector.

Figure 19: Portugal: Cumulative percentage change in GVA and producer prices between 2009 and 2014



Source: Eurostat and own calculations

The relative demand shifts associated with fiscal consolidation and internal devaluation policies were expected to lead to a reallocation of resources away from non-tradable sectors to tradable sectors as demand for domestically produced goods originating within the country would decline relative to demand originating from abroad (which is directed exclusively on traded goods).<sup>9</sup> Yet, as noted above, this has not been, so far, the case for Greece.

The rise of the relative size of the non-tradable sector is not easy to explain. In what follows we try to examine some explanations not related to differential rates of tax evasion, and then we turn to the tax evasion one.

If one was to identify the tradable sector with manufacturing, a possible explanation may rest on the lack (and increased cost) of credit for the survival or expansion of existing firms, and the creation of new ones. This constraint would naturally be more binding for firms requiring a larger amount of start-up financing in order to be created; such firms are

<sup>9</sup> External rebalancing is also conditioned on a decline in the prices of tradable goods relative to the rest of the world. The reallocation of labour to tradable sectors would be driven by increased profitability (due to wage reductions and increases in the relative prices of tradable goods) along with higher export demand (resulting from the absolute decline in tradable prices), or via falling non-tradable prices (which can also help lower the production costs of domestically produced tradable goods that require intermediate non-tradable inputs).



more likely to reside in the manufacturing sector than in retail trade. Moreover, the crisis has fostered what has always been the case in Greece: “necessity” entrepreneurship, i.e. people that become “entrepreneurs” (i.e. shopkeepers, converting family vacation homes into rental units) after losing their job as an employee, or young entrants in the labour force who after being disappointed searching for a job use the family’s accumulated savings in order to start a small business. Such firms usually remain very small – if they ever employ anybody beyond family members – and do not export or produce goods which are substitutes for imports.<sup>10</sup> Some indication that such a mechanism may have been in operation comes from noting that the ratio of employment in “wholesale and retail trade, etc.” to employment in “manufacturing”, which was hovering between 3.0 and 3.2 from 2000 until 2009, it rose continuously during the crisis and it reached 3.8 in 2014. (The same holds for the ratio of GVA, which rose from 2.74 in 2009 to 3.38 in 2014.) To the extent that this development reflects the causes mentioned above, it does not portend well for the future of the Greek economy.<sup>11</sup>

A more direct (and complementary) explanation may have to do with the fact that the collapse of GVA in “construction” by 61% between 2009 and 2014 has reduced the demand for the products of manufacturing firms producing intermediate inputs (e.g. cement, steel) used in construction. (The corresponding decline in construction in Portugal was 37%.) This explanation matches well with the far larger decline in total sales of intermediate goods to the domestic market (by 55%) relative to other goods (and relative to export revenue). The combination of forces mentioned above has produced a particularly strong effect on overall manufacturing production given the large share of construction-dependent industries in total industrial production. Indeed, the Supply-Use-Input-Output Tables (SUIOT) of Eurostat (accessed on March 31, 2015) for the Greek economy show that “construction” is, by far, the pre-eminent user of intermediate inputs sourced from domestic manufacturers; in 2009, the intermediate consumption of the “construction” sector alone was 19% of all sectors’ sourcing from the domestic manufacturing sector.<sup>12</sup> (We note that “construction” is also, by far, the pre-eminent user of services sourced from “professional, scientific and technical activities”, representing 22% of the demand for the services of this sector (e.g. architects and engineers).)

---

<sup>10</sup> In fact, all too often, producers of traded goods who have lost their business to foreign competitors set up companies which engage in wholesale importing of their competitors’ products. Treating wholesale trade as part of the traded sector would in this case (partly) mask the erosion of the country’s capacity to produce tradable goods.

<sup>11</sup> However, it should be mentioned that employment developments may be related to differential rates of conversion across activities from full-time to part-time employment contracts. Nevertheless, this should not be the case for GVA.

<sup>12</sup> We note that the share of GVA in “construction” was just 5% of the aggregate economy’s GVA in 2009.

Credit frictions may have also been instrumental in preventing a reorientation of domestic production to exports as domestic demand collapsed. It is well known (e.g. Melitz and Trefler, 2012) that only a small subset of firms within a particular industry export, that non-exporters are less productive than exporters and pay lower wages, and that exporting firms are larger in every dimension (e.g. in terms of sales, employment, number of distinct goods produced) than non-exporting ones. A reduction in domestic demand due to fiscal consolidation will impact on exporting and non-exporting firms in different ways:

- Some of the least-productive non-exporting firms will shut down; these firms were surviving before the crisis only because demand was adequate enough to generate operating profits that covered their fixed (sunk) costs.
- The more productive among the non-exporting firms will try to substitute for the fall in domestic demand by starting to export. In principle, they will be helped in this endeavour by the reduction in wages associated with the process of internal devaluation. However, the switch to exporting is fraught with difficulties for would-be first-time exporters due to substantial costs related to acquiring information about foreign markets, customizing their products to fit local tastes and set up distribution networks. Das, Roberts and Tybout (2007) estimate that for Colombian exporters average entry costs into foreign markets range from 344,000 to 430,000 U.S. dollars. Furthermore, because most entry costs must be paid up front, only firms with sufficient liquidity can cover them. The severe credit constraints experienced by Greek firms since 2009 have made the task of first-time entry into foreign markets particularly difficult.<sup>13</sup>
- Existing exporters would, in principle, be able to take advantage of the reduction in wages in order to increase their exports. Nevertheless, the advantage conferred to these firms by the decline in labour costs was, to a large extent, counterbalanced by the large increases in non-labour costs due to the rise in real interest rates (which were often above 10%) and energy costs (mostly as a result of tax hikes). The importance of the evolution of non-labour costs is stronger in Greece than for other countries due to the very low share of labour compensation in industrial GVA for Greece – according to OECD data, Greece had the lowest share of all OECD countries in industry (<https://data.oecd.org/earnwage/employee-compensation-by-activity.htm>, accessed on March 10, 2015).<sup>14</sup> Moreover, according to Eurostat, the implicit tax rate on energy (measured as euros per tonne of oil equivalent) increased

---

<sup>13</sup> Dinopoulos, Kalyvitis, and Katsimi (2015) provide evidence, based on data from Greek exporting firms, for the role of credit constraints in accessing foreign markets.

<sup>14</sup> The same set of OECD data also reveal that the share of employee compensation in GVA was – on average – *five* times as large in services than in industry (for the rest of the countries the difference was less than three times, and for Portugal about three times). This implies that wage declines would be expected to impact more on average costs (per unit of output) in services than in industry – this may have been an additional influence on the rise in the relative price of tradables.

in Greece from €105.69 in 2009 to €186.13 in 2012 (an increase of 76.1%), whereas in Portugal it decreased from €42.82 in 2009 to €34.07 in 2012.<sup>15</sup>

Beyond the considerations mentioned above, for both exporting and non-exporting firms, the immediate effects of the decline in demand arising from domestic agents may – *ceteris paribus* – involve a move up along a (given) decreasing average cost curve. The rise in average costs involved would then be larger the larger is the drop in domestic demand, thus making it harder to increase exports. The difficulty of accessing new markets will be exacerbated by the worsening financial situation of the firm, since the search for new export markets requires financial resources which become scarcer as credit ratings drop.

We note also that breaking into new markets does not happen instantaneously. If, as a result of front-loaded fiscal consolidation, the decline in domestic demand for traded goods is large enough so that it destroys firms' credit rating and worsens their ability to raise finance to expand their operations abroad, the hoped-for increase in exports may be far smaller than if consolidation proceeded at a slower pace initially, thus giving time to firms to expand and consolidate their presence in new markets. In a nutshell we can describe the process described above as the confluence of factors shifting both the (downward-sloping) average cost curves and the product demand curves of monopolistically competitive firms. The global financial crisis produced the initial adverse shock on product demand, which was followed by the reduction in product demand due to a strong dose of front-loaded fiscal consolidation. These shocks would – *ceteris paribus* – induce a leftward (upward) climb along a given average cost curve.<sup>16</sup> The wage declines were expected to shift the average cost curves downward, but were to a large extent neutralized by the increases in non-labour costs (e.g. energy, capital). The uncertain net effect of these shifts, as well the non-availability of credit to enable and speed-up access to foreign markets as they were recovering from the global crisis, may be a relevant explanation of developments since 2009. A diagrammatic presentation of these forces is provided in BOX X below.

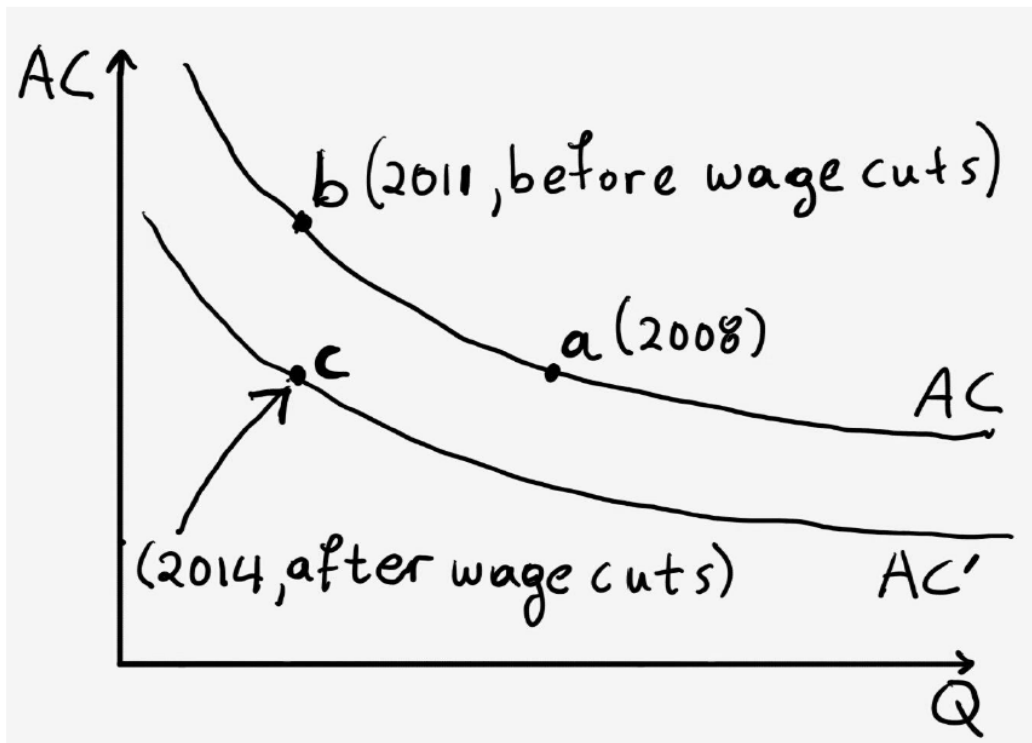
---

<sup>15</sup> We note that this measure does not differentiate between households and business users. Data related to electricity use indicate that the tax burden increased far more for household consumption than for business users – there are no relevant data available for other energy sources.

<sup>16</sup> The effects described here bear some resemblance to Krugman's (1984) "import protection as export promotion".

### Box X: Fiscal Consolidation, Wage Decreases and Price Developments

The presence of fixed costs for many (especially manufacturing-sector) firms implies that although marginal costs may be fixed, average cost curves can be downward-sloping as depicted in the diagram below. The situation, circa 2008, of a typical (imperfectly competitive) firm is depicted by point *a* on the initial average cost curve *AC*. Following the drop in domestic demand – to a large extent due to the fiscal consolidation – and before firms had any chance to access foreign markets for the reasons explained in the text, their output was curtailed to a point like *b*, and firms faced with higher average cost could not expand into foreign markets. Wage reductions came later (minimum wages were reduced in 2012), and this is portrayed as the downward shift of the *AC* curve to *AC'*. To the extent that the rise in world trade was not strong enough to more than offset further cuts in government spending and tax increases, the new point of observation would be something like *c*, displaying little (if any) decline in average costs relative to point *a*. If one takes into account that other parts of firms' costs (e.g. taxes, cost of capital) increased during the period, it becomes easy to understand why the reduction in Unit Labour Costs was not translated into price decreases and why Greek exports did not register a strong recovery.



#### **4. Tax increases and the size of the traded sector**

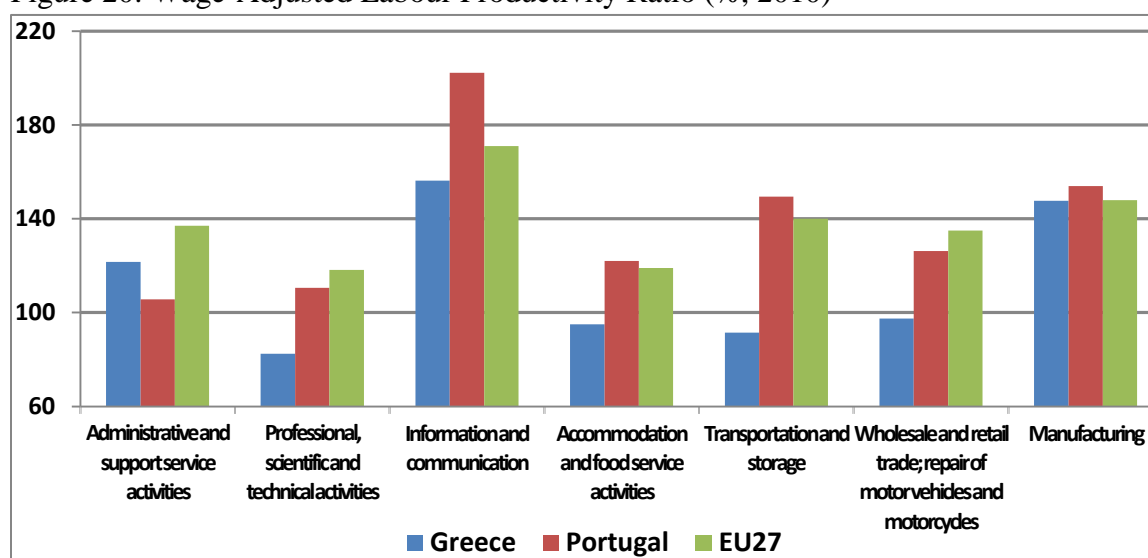
In this section we claim that in order to understand the small size (relative to GDP) of the tradable sector in Greece it is important to go beyond (simple) measures of institutional quality and ease-of-doing-business indices, since these measures tend to stifle the development of both the traded and non-traded sectors – although it may be argued that the traded sector is harmed more by a weak institutional environment. Moreover, we wish to argue that the structure of taxation, and, more particularly, the presence of tax evasion is a factor which has exercised a large influence on the relative size of the traded sector in Greece.

The thrust of our argument is based on the existence of differential rates of tax evasion between the traded and non-traded sectors (see Moutos, 2001; EEAG, 2011). In most countries the non-traded sector is dominated by services producers, many of which are self-employed or employ one or two employees (medical and law services, car repairs, haircuts, restaurants, etc.). Moreover, since these firms usually use too little capital and do not engage in trans-border activities, they rely excessively on cash transactions, thereby avoiding the use of the financial sector. This makes it easier for them to avoid paying taxes as cash transactions leave no paper trail; in contrast, when firms make use of the financial sector, the tax authorities can gain access to their bank records and use this information to enforce the tax law. Eschewing the services provided by the financial sector is more costly for firms engaging in international transactions, thus their ability to evade taxes is smaller than non-traded sector producers. These observations are well matched with the literature on exporting firms – e.g. Melitz and Trefler (2012) document that exporting firms tend to be larger than firms selling only in the home market, and to be more productive as well. It is also well known (e.g. de Paula and Scheinkman, 2011), that exporting firms usually transact with other formal-sector firms, like financial intermediaries, and also need the appropriate documentation to export. The implication of the above is that the effective after-tax relative price of the traded sector is smaller than what one would surmise by looking simply at the prices of the two sectors, thus attracting fewer resources in the traded sector.

Most importantly, the above imply that a rise in the (common) statutory tax rate, for given rates of tax evasion in the two sectors, increases the relative attractiveness of the non-traded sector, and draws more resources away from the traded sector, thus (partly) thwarting the (standard) expected benefits of reduced budget deficits on current account deficits (the “twin deficits” hypothesis), as well as of the other structural reforms (e.g. labour market liberalization) undertaken within the EAP for Greece.

We turn now to a more detailed analysis of the effect of tax hikes on the relative size of the traded sector. As a prelude to this, in Figure 20 we depict what Eurostat calls “wage-adjusted labour productivity” for various NACE-2 activities. The wage-adjusted labour productivity ratio is defined as value added divided by personnel costs which is subsequently adjusted by the share of paid employees in the total number of persons employed, or more simply, apparent labour productivity divided by average personnel costs (expressed as a ratio in percentage terms). Given that this indicator is based on expenditure for labour inputs rather than a headcount of labour inputs, it is more relevant for comparisons across activities (or countries) with very different incidence of part-time employment or self-employment. Although Eurostat constructs this index in order to assess the evolution of competitiveness, its relevance for our purposes arises from the fact that for Greece, in four of the activities shown, value added was smaller than personnel costs (i.e. the ratio was less than 100). In fact, there was no other country among the EU27 (data for Malta are missing) which had even a single activity for which this was the case. As it happens, the activities for which the ratio was less than 100 in Greece are the ones for which there is both anecdotal and non-anecdotal evidence (see, e.g. Vasardani, 2011; Artavanis, Morse, and Tsoutsoura, 2012) that are sectors rife with tax evasion. Figure 14 also indicates that “manufacturing” was the only activity for which the index was similar in Greece, Portugal, and the EU27 average, possibly indicating that tax evasion is not particularly large in this sector.

Figure 20: Wage-Adjusted Labour Productivity Ratio (% , 2010)

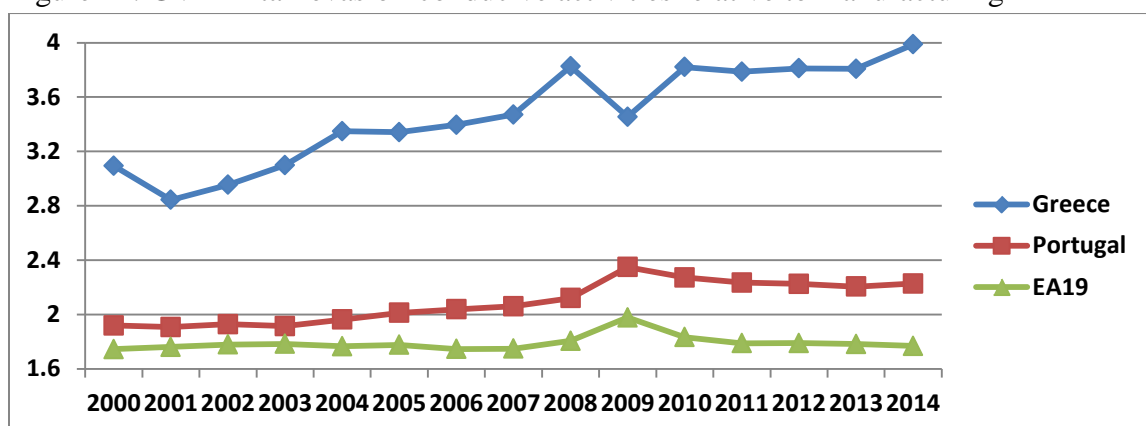


Source: Eurostat

Figure 21 shows the evolution of GVA in activities with a wage-adjusted labour productivity ratio less than 100(%) relative to manufacturing GVA in Greece, Portugal, and the aggregate of the euro area (EA19). We observe that the ratio of GVA in these

“tax-evasion-conductive” activities to GVA in manufacturing rose continuously in Greece from 3.09 in 2000, to 3.46 in 2009 and to 3.99 in 2014, whereas in Portugal it rose from 1.92 in 2000 to 2.35 in 2009, and then it declined to 2.23 in 2014. For the aggregate of EA19 there was a rise from 1.75 to 1.98 between 2000 and 2009, and then it declined to 1.77 in 2014. The very high relative value and the inexorable rise of the relative share of tax-evasion-conductive activities relative to manufacturing in Greece suggests that differential rates of tax evasion across activities may have influenced the allocation of economic activity away from the manufacturing sector. Moreover, the non-reversal of this trend for Greece after 2009 suggests that we cannot preclude the larger relevance of this mechanism as tax rates increased after 2009 for the shift away from manufacturing. Nevertheless, we have no way of assessing the relative strength of this mechanism against the other hypotheses examined above; most likely the aggregate demand mechanisms played the dominant role initially, and the supply-side mechanisms acquired more influence later.

Figure 21: GVA in tax-evasion-conductive activities relative to manufacturing



Source: Eurostat and own calculations

## 5. Could fiscal devaluation have worked?

The idea that revenue-neutral changes in tax/subsidy rates can be used to address competitiveness problems for countries lacking the exchange rate instrument has a long pedigree as it was proposed by Keynes in 1931.<sup>17</sup> In today’s context, given that explicit taxes on trade are clearly ruled out for most countries by trade commitments, the same effect could be achieved through a reduction in the social security contributions coupled with a rise in VAT rates – the so-called fiscal devaluation. This would work since it would reduce production-based taxes (which are effectively levied on an origin basis) and

<sup>17</sup> Keynes proposed that a combination of an import tariff and an export subsidy would raise the domestic price of importables and reduce the foreign price of exportables, thus mimicking the effects of currency devaluation.

offset the revenue loss by increasing VAT rates (which are levied on a destination basis). This policy usually focuses on reducing the employers' contribution—rather than the employee's, or even personal taxes on labor income— and reflects the view that the wage paid by employers net of their contributions is rigid (de Mooij and Keen, 2012).<sup>18</sup>

The high incidence of tax evasion – including on VAT and social security contributions - in Greece implies also that the success of a policy of fiscal devaluation will depend, *inter alia*, on the relative (marginal) rates of evasion on VAT and social security contributions (SSC). We consider now three cases:

- If there is no tax evasion on either VAT or SSC, then fiscal devaluation can, in principle, be effective (unless otherwise stated we assume that VAT rates are below their revenue-maximizing rate so that the policy is feasible – i.e. it can raise the required revenue, if there is no VAT evasion).
- Consider now that tax evasion plagues SSC, and there is no tax evasion on VAT. Then, fiscal devaluation may be a more powerful lever – than in the case of no tax evasion- in effecting an increase in the size of the traded sector. This is because the reduction in SSC would reduce the tax burden of the traded sector by more than of the non-traded sector, since the latter is mainly populated by small (often informal) firms, which tend to evade on the social security contributions far more than the larger traded-sector firms.
- If tax evasion exists for both SSC and VAT, one must take into account whether the rise in VAT rates will bring in the required revenue to offset the loss in revenue from SSC, and its allocative consequences regarding the size of the shadow economy. In principle, an important advantage of VAT is that firms that operate in the shadow economy may escape VAT liability on their sales, but, thus, they forego the opportunity to reclaim credit for any VAT paid on inputs bought from VAT-compliant suppliers. It has therefore been suggested that one way to impose an appropriate tax burden on those in the informal sector is by increasing VAT rates. On the other hand Emran and Stiglitz (2005) and Keen (2008) have demonstrated that the resulting increased taxation of the formal sector may expand rather than reduce the relative (and absolute) size of the shadow economy. Given these adverse allocative consequences of a rise in VAT rates and the beneficial consequences of a reduction in SSC rates, it is not clear – without knowing the extent of the differences in tax evasion between VAT and SSC - that fiscal devaluation would have the hoped-for beneficial effects. This is particularly pertinent in the Greek case since –as mentioned in Section 2 – Greece's VAT compliance gap is very high, thus making it

---

<sup>18</sup> If instead the net (after social security contributions paid by the worker) wage received by the worker was rigid, a reduction in the employee's contribution rates or personal income tax rates could accomplish the same task as well.



very likely that the rise in VAT rates necessary to offset the loss of SSC revenue would hit either revenue-maximizing<sup>19</sup> or political-economy constraints.

Political-economy constraints against large VAT rises stem from the presumed regressive nature of VAT, especially when the base of comparison is current net income.<sup>20</sup> OECD (2014) has calculated that the incidence of consumption taxes (VAT being the most important of them) in Greece is very regressive: for married households at the bottom decile of the income distribution the average consumption tax as percentage of net income was more than twice the one faced by households at the top decile – e.g. for households with 2 adults and children the corresponding rates were 23.9% and 10.5%, respectively.

One way to avoid the heavily binding political-economy considerations of increasing VAT rates (in Greece the top rate was raised from 19% to 23% in 2010) would be to finance the cut in SSC rates by increasing the corporate income tax rate (CIT). de Mooij and Keen (2012) have presented empirical evidence which suggests that the effect of financing the cut in SSC through increases in VAT or the CIT on net exports are substantial (in the short run), with the effect being stronger (in both an economic and a statistical sense) if the CIT channel is used.<sup>21</sup> We note that in Greece the effective tax rate on corporate income declined from 19.4% in 2009 to 13.2% in 2012 (in fact, it is the only effective tax rate that declined substantially during this period and is far below the EA12 average)<sup>22</sup>, while the effective tax rate on employed labour income increased from 30.1% to 37.9%; this suggests that financing the cut in the SSC rate through a rise in the CIT rate could face fewer revenue-maximizing and political-economy constraints.

Greece did, to some extent, implement some forms of fiscal devaluation, although they took a different form, they were never thought out as a coherent policy package, and they were mostly a by-product of efforts at increasing revenue and reducing tax evasion by the self-employed. Along with raising the standard VAT rates from 19% in 2009, to 21% on March 2010, and to 23% on July 2010, the reduced rate was raised from 9% in 2009 to

---

<sup>19</sup> In principle one ought to take into account how changes in VAT and SSC rates may affect income tax evasion (e.g. a rise in VAT rates may make it more attractive for consumers to collude with sellers – the former to avoid being burdened with VAT, the latter to escape income taxation).

<sup>20</sup> VAT is less regressive (it could even be made progressive) if the base against which the tax burden is calculated is current expenditure, i.e. if one adopts a lifetime income perspective and allows for the possibility of borrowing/lending in order to smooth consumption. However, no policymaker would be able to “explain” this to the masses of unemployed and credit-constrained Greek households.

<sup>21</sup> The empirical finding that the influence on net exports is larger if increases in the CIT are used as a financing device may stem from its adverse effect on investment; if this is the relevant channel, the case for CIT hikes is weakened.

<sup>22</sup> Changes introduced in 2013 and 2014 will probably register as increases in the effective tax rate on corporate income when data for its calculation become available.

13% in January 2011, whereas the lowest rate was gradually raised to 6.5% (from 4.5% in 2009).<sup>23</sup> Employers' SSC rates were reduced by 1 p.p. on November 2012, and by a further 2.9 p.p. on July 2014. (The employees' SSC rates were reduced by 1 p.p. on July 2014.) It is too early to assess the somewhat substantial reduction in SSC for employers implemented on July 2014.<sup>24</sup>

Another policy intervention which may have helped to increase the relative size of the traded sector was instituted in 2013 and it concerned the taxation of self-employed income; for incomes earned in 2013, the reported income of the self-employed was taxed at 26% up to a maximum of €50,000 per annum, and at 33% above it, and without any tax exemption threshold. In the past, the existence of a significant tax exemption threshold (as high as €12,000 per annum) meant that the self-employed (which range from lawyers, physicians, architects, and engineers to shop-owners, plumbers, and electricians) would often declare incomes either just below or just above the threshold, thus effectively paying either no, or very little, tax.<sup>25</sup> Some (weak) evidence that this policy might have helped to reverse the decline of the relative size of the traded sector is provided in Figures 6, 7, and 8, although Figure 15 points in the opposite direction. In any case, given the short time that has elapsed since the above policy initiatives were undertaken, and the relatively long gestation period of most "structural reforms" relative to the more immediate impact on aggregate demand caused by decreases in government spending, it would be incorrect to conclude at this point that the "fiscal devaluation" policies mentioned above, despite the haphazard way in which they were implemented, should be reversed.

In a recent paper Pappadà and Zylberberg (2015) have calculated that the 2010 hikes in VAT rates in Greece generated a large increase in VAT evasion. More specifically, they found that VAT collection efficiency declined by 10% in 2010 and it remained at this lower level for the subsequent years<sup>26</sup> - mainly because small- and medium-sized firms

---

<sup>23</sup> A reduced rate by 30% (of the above rates) holds for many islands, whereas the rate for food offered by hotels and restaurants was decreased from 23% to 13% on August 2013.

<sup>24</sup> We note also that since 2009 the Greek Manpower Employment Organization (OAED) has tried to increase the number and diversity of initiatives designed to re-integrate people with previous employment experience, provide training, and incentivize the hiring of first-time employment seekers. Most of the initiatives have taken the form of either allowing the enterprises to pay sub-minimum wages or receive wage subsidies (usually through reductions in social security contributions). These initiatives were aimed – in total – at helping more than 300.000 individuals to find or preserve their jobs.

<sup>25</sup> We note that tax evasion among the self-employed is not high only in Greece, but also in countries with far more efficient tax administration like Denmark (Kleven, Knudsen, Kreiner, Pedersen, and Saez, 2011) and the United States (Slemrod and Yitzhaki, 2002).

<sup>26</sup> This finding is consistent with the reduction in C-efficiency we reported above, and it implies a loss of 1.4 billion euros per annum (about 0.8% of GDP) relative to what VAT revenue would have been if collection efficiency remained intact. We note that the actual loss in total tax revenue will be larger if we take into account that income tax revenue will also have declined in response to more VAT evasion.

expanded their share of non-declared activity. These authors also report that in euro area countries with strong tax monitoring, the VAT collection efficiency is very stable and less sensitive to tax hikes. It should also be noted that the decline in VAT collection efficiency was observed during a period in which the Troika of lenders was actively involved in increasing the efficiency of Greek tax administration.

We consider now a “back-of-the-envelope” calculation which involves the following type of fiscal devaluation: a further reduction in the SSC rate for employers by 4.0 p.p., and a rise in the VAT rate so as to keep the budget outcome unchanged. The reduction in the employers SSC rate would involve a reduction by 10% in the sum of employers and employees rates existing in 2014, and - at unchanged levels of SSC evasion, wages and employment - it would reduce the government’s revenue by 2.4 billion euros (10% of the 24.0 billion euros received in 2014). Total VAT receipts were a little below 14 billion in 2014, thus a rise of VAT revenue by 2.4 billion (to finance the cut in SSC revenue) would have to increase VAT revenue by about 17%, and the standard VAT rate by about 4 p.p. (i.e. to bring it to 27%) if there was no deterioration in collection efficiency. A more reasonable assumption would be that there would be a decline in collection efficiency in response to the further rise in the VAT rates. Let us assume, conservatively,<sup>27</sup> that the decline in collection efficiency would be the same as calculated by Pappada and Zylberberg (2015) for the 2010 VAT hikes. Then the required rise in the VAT rate would have to be about 7 p.p., thus bringing the VAT rate to 30%.

To gauge the consequences of the reduction in employer SSC by 4 p.p. on production, we start by assuming that the tax substitution involved would not have any influence on aggregate demand.<sup>28</sup> Employee compensation (wages and salaries payable in cash or in kind, and the value of social contributions payable by employers) has been below 10% of GVA in industry for all years since 1995 – it stood at only 6.4% in 2014,<sup>29</sup> whereas the corresponding figure for services rose from 23% in 1995 to 32.9 in 2011, and to 31.4% in 2014 (OECD, 2015). There are two implications of these figures. First, the help to industrial firms from a 4 p.p. reduction in employer SSC (equivalent to 16% reduction in the initial rate) would be very small - less than 1% of total production costs. Second, the reduction in production costs would be relatively more substantial for services, thus inducing a relative expansion of services vi-a-vis industry. Before concluding that the effects of these SSC reductions would be small, we must also take into account that both

---

<sup>27</sup> The decline in collection efficiency will most likely be larger the higher is the initial VAT rate.

<sup>28</sup> Aggregate demand may decrease since it would involve transferring purchasing power from low-income (and more credit-constrained) households to high-income households.

<sup>29</sup> To appreciate how small this figure is in comparison to other countries, we note that it was the lowest among all OECD countries. A possible explanation for the low figure in Greece is that the country specializes in capital- and energy-intensive industries (e.g. petrochemicals), whose existence could be due to laxer environmental standards or to a conflict-ridden model of industrial relations.

sectors (i.e. industry and services) use as intermediate inputs the outputs of the other sector, so the overall impact on cost competitiveness of the Greek economy would be slightly larger, but hardly substantial overall.<sup>30</sup> Given the small impact on domestic costs of such a fiscal devaluation strategy, the large delays in rebating VAT to exporters,<sup>31</sup> and the huge political costs that a government would incur if it ever suggested an increase of the VAT rate to 30% due to its adverse distributional impacts,<sup>32</sup> we must conclude that the economic benefit would be far lower than the political capital that a government would have to expend on such a policy.

## 7. Concluding Remarks

Given the rather meager effects that a further dose of fiscal devaluation would procure, it is obvious that a more effective policy (on both economic and political grounds, although the political costs of the policy would not be negligible), and which could mimic the effects of fiscal devaluation is a conscious effort at reducing tax evasion. Suppose the government switches 20.000 civil servants from their current tasks (we note that the Troika insists that many parts of the public administration are overstaffed, and some of them should be fired), moves them –after a brief training- to the tax revenue department, and gives them the responsibility to walk around and constantly check on whether the thousands of small businesses and self-employed professionals issue receipts. (These tax officials could rotate constantly across neighborhoods and could work in pairs checking on customers leaving the premises; appropriate incentive schemes to prevent them from colluding with the shop-owners and the self-employed could also be devised.) Given that the number of tax units/ business concerns per pair of civil servants would then be around 50, this would increase considerably the number of receipts issued by shop-keepers and self-employed professionals. Assume that this increase in monitoring results in a reduction in tax evasion by 20%. Under standard assumptions about the size of the shadow economy (around €50 billion), this would result in an increase in the tax base by about €10 billion, and in tax revenue (of all types: income, SSC, and VAT) by at least €3bn. Even if these 20.000 tax officials were new hires, the total cost of their employment would not exceed €0.5 billion. Thus the net (positive) effect on the budget could be at least €2.5 billion (about 1.4% of GDP). Part of these funds could be used to reduce – through a reversal of the tax hikes imposed since 2010 - the really high energy costs faced by Greek manufacturing.

---

<sup>30</sup> Nevertheless, to the extent that (some) services can be considered as part of tradables, this would be a welcome development.

<sup>31</sup> The Greek press often reports of cases involving years of delays in rebating VAT to exporters. In January 2015 it was reported that the average delay is 304 days - the cases involving delays more than 90 days were about 2/3 of the total in 2014.

<sup>32</sup> Giannitsis and Zografakis (2015) document the increased burden that higher VAT rates place on medium income groups, i.e. the groups most likely to be the focus of political parties' attention.

This policy could also have beneficial longer-run effects on the allocation of resources between the traded and non-traded sectors for reasons explained earlier. The main drawback of this policy – especially given the huge unemployment – is that it would eliminate the many small shop-keepers who currently survive only because they evade taxes. Although this should be a welcome development towards an economy in which average firm size (and productivity) increases, and tax evasion decreases, it will immediately increase unemployment and social strife. An increase in the generosity and coverage of the social welfare system (currently only about 10% of the unemployed receive unemployment benefits) could ameliorate the consequences of this policy during the transition to a more viable socio-economic model.

A final remark is in order. Given the, literally, hundreds of issues that were specified in the two EAP's agreed between successive Greek governments and the Troika, and on which sometimes an inordinate amount of time and effort was expended despite the minor importance of some issues for the transformation of the Greek economy, one wonders what would have happened if all effort was concentrated on a handful of issues, with tax reform and tax evasion being high on the agenda. The high incidence of tax evasion in non-traded sectors in Greece means that the effects of a heavy dose of fiscal devaluation could be achieved if only tax evasion (especially the VAT compliance gap) was brought closer to the EU average. Limiting tax evasion would be the “mother” of structural reforms in Greece.

## References

- Alm, J. and A. El-Ganainy (2013): "Value Added Taxation and Consumption," *International Tax and Public Finance*, 20(1): 105-128.
- Artavanis, N.T., A. Morse, and M. Tsoutsoura, 2012, "Tax evasion Across Industries: Soft Credit Evidence from Greece", Chicago Booth Research Paper No. 12-25.
- CPB (2013), Study to quantify and analyse the VAT Gap in the EU-27 Member States, Netherlands Bureau for Economic Policy Analysis.
- Das, S., Roberts, M. and Tybout, J. (2007), "Market Entry Costs, Producer Heterogeneity, and Export Dynamics," *Econometrica*, vol. 75, 837-873.
- Dinopoulos, E., Kalyvitis, S., and Katsimi, M. (2015), "Export Pricing and Credit Constraints: Theory and Evidence from Greek Firms", mimeo.
- de Paula, A., and Scheinkman, J. (2009), "The Informal Sector", PIER Working Paper 08-018, Penn Institute for Economic Research, Philadelphia.
- de Mooij, R. and M. Keen (2012) "Fiscal Devaluation" and Fiscal Consolidation: The VAT in Troubled Times", IMF Working Paper, 12-85.
- Ebrill, L., M. Keen, J-P. Bodin, and V. Summers (2001). *The Modern VAT*, Washington, International Monetary Fund.
- EEAG (2011), *The EEAG Report on the European Economy*, "Greece", CESifo, Munich 2011, pp. 97–125.
- Emran, Shahe M., and Joseph E. Stiglitz, 2005, "On Selective Indirect Tax Reform in Developing Countries," *Journal of Public Economics*, Vol. 89, pp. 599–623.
- Per Engstrom & Bertil Holmlund, 2009. "Tax evasion and self-employment in a high-tax country: evidence from Sweden," *Applied Economics*, Taylor & Francis Journals, vol. 41(19), pages 2419-2430
- ECB (2006). Competition, productivity and prices in the euro area services sector. Occasional Paper Series 44, Taskforce of the Monetary Policy Committee of the European System of Central Banks.
- European Economy (2010), *The Economic Adjustment Programme for Greece*, Occasional Papers 61, May 2010.
- European Economy (2012), *The Second Economic Adjustment Programme for Greece*, Occasional Papers 94, March 2012
- Gervais, A., and J. B. Jensen, 2013, "The Tradability of Services: Geographic Concentration and Trade Costs," NBER Working Papers 19759, National Bureau of Economic Research, Cambridge, Mass.

Giannitsis, T. and S. Zografakis, 2015, Greece: Solidarity and Adjustment in Times of Crisis, Hans-Boeckler-Foundation, IMK Study No. 38, Athens.

Gregorio, J. D., Giovannini, A., and Wolf, H. C. (1994). International evidence on tradables and nontradables inflation. *European Economic Review*, 38(6):1225–1244.

Jensen, J. B. and L. G. Kletzer, 2005. "Tradable Services: Understanding the Scope and Impact of Services Outsourcing," Working Paper Series WP05-9, Peterson Institute for International Economics.

Keen, M. (2013): "The Anatomy of the VAT," *National Tax Journal* 66 (2): 423-446.

Keen, M., 2008. "VAT, tariffs, and withholding: Border taxes and informality in developing countries," *Journal of Public Economics*, Elsevier, vol. 92(10-11), pages 1892-1906, October.

Kleven, Henrik, Martin Knudsen, Claus Kreiner, Soren Pedersen , and Emmanuel Saez "Unwilling or Unable to Cheat? Evidence from a Tax Audit Experiment in Denmark " , *Econometrica* 79(3), 2011, 651 - 692.

Krugman, P. (1984), "Import Protection as Export Promotion", in H. Kierzkowski (ed.), *Monopolistic Competition and International Trade*, Blackwell, Oxford.

Melitz, M. J. and D. Trefler (2012), "Gains from Trade when Firms Matter", *Journal of Economic Perspectives*, vol. 26, pp. 91-118.

Mendoza E., Razin, A., Tezar, L. (1994). Effective Tax Rates in Macroeconomics: Cross-Country Estimates of Tax Rates on Factor Incomes and Consumption, *Journal of Monetary Economics*, 34, 297-323.

Moutos, T. (2001), "Tax Evasion and the Balance of Payments", in C. Paraskevopoulos, A. Kintis, and T. Georgakopoulos (eds), *The Asymmetric World Economy*, Edward Elgar, UK.

OECD (2012), *Consumption Tax Trends 2012*, OECD, Paris

OECD (2014), *The Distributional Effects of Consumption Taxes in OECD Countries*, OECD, Paris.

OECD (2015), *Employee compensation by activity (indicator)*. doi: 10.1787/7af78603-en (Accessed on 26 April 2015).

F. Pappadà and Y. Zylberberg (2015), "Austerity Plans and Tax Evasion : Theory and Evidence from Greece," Document De Travail N° 546, Bank of France.

D. Papageorgiou, T. Efthimiadis and I. Konstantakopoulou (2012), *Effective Tax Rates in Greece*, Discussion Paper No. 124, Centre of Planning and Economic Research, Athens.

Piton, S. (2015), "Monetary Integration and the Nontradable Sector", mimeo.

Slemrod, J. and S. Yitzhaki (2002), "Tax Avoidance, Evasion, and Administration", in A.J. Auerbach and M. Feldstein (eds), *Handbook of Public Economics*, Elsevier, Amsterdam 2002.

Vasardani, M (2011), "Tax Evasion in Greece: A General Overview", *Economic Bulletin* no. 35, pp. 15-26, Bank of Greece (in Greek).



## Appendix: Computation of effective tax rates

Table A1 reports the variables used for the computation of the effective tax rates.

**Table A1: List of macroeconomic variables**

<b>Variable</b>	<b>Definition</b>	<b>Source</b>
<i>TYH</i>	taxes on income of households including capital gains	Eurostat
<i>WSS</i>	compensation of employees	Eurostat
<i>SSC</i>	actual total social security contributions	Eurostat
<i>GOSH</i>	gross operating surplus and mixed income of households	Eurostat
<i>CFCH</i>	consumption of fixed capital of households	Eurostat
<i>PIR</i>	property income received by households	Eurostat
<i>PIP</i>	property income paid by households	Eurostat
<i>SSCER</i>	social security contributions paid by the employers	Eurostat
<i>SSCEE</i>	social security contributions paid by the employees	Eurostat
<i>SSCSE</i>	social security contributions paid by the self-employed	Eurostat
<i>TYF</i>	taxes on the income or profits of financial corporations including capital gains	Eurostat
<i>TYC</i>	taxes on income or profits of non-financial corporations including capital gains	Eurostat
<i>GOSNF</i>	gross operating surplus and mixed income of non-financial corporations	Eurostat
<i>GOSF</i>	gross operating surplus and mixed income of financial corporations	Eurostat
<i>CFCNF</i>	consumption of fixed capital of non-financial corporations	Eurostat
<i>CFCF</i>	consumption of fixed capital of financial corporations	Eurostat
<i>ST</i>	stamp taxes	Eurostat
<i>TFC</i>	taxes on capital and financial transactions	Eurostat
<i>OTP</i>	other taxes in production	Eurostat
<i>CTAX</i>	capital taxes	Eurostat
<i>GOS</i>	gross operating surplus and mixed income of the total economy	Eurostat
<i>CFC</i>	consumption of fixed capital of the total economy	Eurostat
<i>TPI</i>	taxes on production and imports	Eurostat
<i>CT</i>	consumption taxes	$CT = TPI - ST - TFC - OTP$
<i>HC</i>	household and NPISH final consumption expenditures	Eurostat
<i>GIC</i>	government intermediate consumption expenditures	Eurostat
<i>VAT<sub>rate</sub></i>	standard statutory VAT rate	Eurostat

### ***Personal income tax rate***

Data on tax revenue data do not provide a breakdown of tax revenue from individual labour and capital income. Following Mendoza, Razin, and Tesar (1994) we decompose tax revenue from labour and capital income of households by assuming that all sources of households' income, namely labour and capital income, are taxed at the same rate.<sup>33</sup> Thus, the personal income tax rate that applies both to labour and capital income of households is computed as:

$$\tau^h = \frac{TYH}{(WSS + GOSH) - (SSC + CFCH) + (PIR - PIP)} ,$$

### ***Effective tax rate on employed labour income***

The effective tax rate on labour income is computed as:

$$\tau^l = \frac{\tau^h (WSS - SSCER - SSCEE) + SSCER + SSCEE}{WSS}$$

### ***Effective tax rate on capital income***

The effective tax rate on capital income is computed as:

$$\tau^k = \frac{\tau^h [(GOSH - CFCH - SSCSE) + (PIR - PIP)] + CTAX + TYC + TYF + ST + TFC + OTP}{GOS - CFC}$$

### ***Effective tax rate on consumption***

The effective tax rate on consumption is computed as:

$$\tau^c = \frac{CT}{HC + GIC - CT}$$

### ***Effective tax rate on self-employment income***

The effective tax rate on self-employment income is constructed as:

$$\tau^{se} = \frac{\tau^h (GOSH - CFCH - SSCSE) + SSCSE}{GOSH - CFCH}$$

---

<sup>33</sup> Eurostat, provides tax revenues from the personal income tax on labour, capital and self-employment income based on its own calculations and using country data not always in the public domain. The qualitative and quantitative results are very similar when we use Eurostat's data.

***Effective rate related to social security contributions (employees, employers)***

The (effective) rate regarding social security contribution payments (or effective non-wage labour cost rate), which is a measure of the burden of employment income for social security contributions, is calculated as follows:

$$\tau^{ssc} = \frac{SSCER + SSCEE}{COMP}$$

The effective rate which shows the burden from social security contributions that burdens the income of employees (non-wage labour cost of employed labour paid by the employees) can be defined as follows:

$$\tau^{ssc\_ee} = \frac{SSCEE}{COMP}$$

while the respective rate for employers is:

$$\tau^{ssc\_er} = \frac{SSCER}{COMP}$$

***Effective rate on social security contributions paid by the self-employed :***

$$\tau^{ssc\_se} = \frac{SSCSE}{GOSH - CFCH}$$

***Effective tax rate on corporate income***

The effective tax rate on corporate income is calculated as:

$$\tau^{corp} = \frac{TYNF + TYF}{(GOSNF + GOSF) - (CFCNF + CFCF)}$$

***C-efficiency index***

The C-efficiency index is computed as the ratio of actual VAT revenues divided by the product of the VAT standard statutory tax rate and pre-tax value final consumption:

$$C^{eff} = \frac{VAT}{VAT_{rate} (HC + GIC - CT)}$$