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Effective Tax Rates in Greece

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CENTRE OF PLANNING AND ECONOMIC RESEARCH

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Τελικοί Φορολογικοί Συντελεστές στην Ελλάδα

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Περίληψη

Σκοπός της παρούσας μελέτης είναι: α) να υπολογίσει και να παρουσιάσει τους τελικούς (ή αποτελεσματικούς) φορολογικούς συντελεστές (effective tax rates) της ελληνικής οικονομίας και να προβεί, όπου είναι εφικτό, σε σύγκριση με τους αντίστοιχους τελικούς φορολογικούς συντελεστές της Ευρωζώνης και β) με βάση τη σύγχρονη οικονομική θεωρία να προτείνει φορολογικές πολιτικές οι οποίες μπορούν να συνεισφέρουν στη δημοσιονομική εξυγίανση της χώρας. Οι τελικοί φορολογικοί συντελεστές είναι δείκτες οι οποίοι ενσωματώνουν όλες τις πληροφορίες ενός φορολογικού συστήματος (φοροαπαλλαγές, εκπτώσεις δαπανών από το φορολογητέο εισόδημα, κ.α.) και την αποτελεσματικότητα του φοροεισπρακτικού μηχανισμού, ενώ δείχνουν τον συντελεστή με τον οποίο πραγματικά επιβαρύνονται οι διάφορες πηγές εισοδήματος των επιχειρήσεων και των νοικοκυριών. Η ανάλυση των φορολογικών συντελεστών παρέχει πληροφορίες για την κατανομή του τελικού φορολογικού βάρους μεταξύ των οικονομικών παραγόντων και των διαφόρων πηγών εισοδήματός τους. Επιπλέον, στο βαθμό που αντικατοπτρίζουν μεταβολές στη φορολογική πολιτική, μπορούν να χρησιμοποιηθούν για την εξέταση των επιπτώσεων των μεταβολών αυτών στην οικονομική δραστηριότητα.

Ένας τελικός φορολογικός συντελεστής ορίζεται ως ο λόγος μεταξύ των φορολογικών εσόδων από μία συγκεκριμένη πηγή εισοδήματος και της αντίστοιχης φορολογικής βάσης.¹ Για παράδειγμα, ο τελικός φορολογικός συντελεστής στο εισόδημα από μισθωτή εργασία

1

Ο υπολογισμός των τελικών φορολογικών συντελεστών στηρίζεται στη μεθοδολογία των Mendoza et al. (1994). Για μια εκτενή επισκόπηση της σχετικής βιβλιογραφία βλέπε Papageorgiou (2009). Για τον υπολογισμό των τελικών φορολογικών συντελεστών χρησιμοποιήθηκαν δεδομένα που προέρχονται από τη Eurostat και τον ΟΟΣΑ. Τα δεδομένα για την Ελλάδα αφορούν τη χρονική περίοδο 2000-2009. Οι τελικοί φορολογικοί συντελεστές για την Ευρωζώνη προέρχονται από εκτιμήσεις των συγγραφέων, από τη εργασία των Βασιλάτου, Κολλίντζα και Παπαγεωργίου (2010) και European Commission (2010). Τα δεδομένα αφορούν τη χρονική περίοδο 2000-2008.

(effective tax rate on employed labour income) υπολογίζεται ως ο λόγος μεταξύ της συνολικής επιβάρυνσης του εισοδήματος από εργασία (δηλαδή τα έσοδα από τη φορολόγηση των καθαρών μισθών και τις πληρωμές των ασφαλιστικών εισφορών) και του συνολικού ακαθάριστου εισοδήματος από εργασία (total compensation). Με τον ίδιο τρόπο, εκτιμάται και ο τελικός φορολογικός συντελεστής στο εισόδημα από κεφάλαιο (effective tax rate on capital income). Πιο συγκεκριμένα, υπολογίζεται ως ο λόγος των συνολικών εσόδων από τη φορολογία του εισοδήματος του κεφαλαίου προς το συνολικό εισόδημα από κεφάλαιο. Τα έσοδα από τη φορολόγηση του κεφαλαίου περιλαμβάνουν κυρίως φόρους από χρηματοπιστωτικές συναλλαγές (π.χ. φόροι στην έκδοση και μεταπώληση τίτλων, φόροι από την πώληση ακίνητης περιουσίας), κληρονομιά, ακίνητη περιουσία, τόκους και εισοδήματα και κέρδη επιχειρήσεων. Πρέπει να επισημανθεί ότι στα έσοδα από τη φορολόγηση του κεφαλαίου περιλαμβάνονται και τα έσοδα από τη φορολόγηση του εισοδήματος των αυτοαπασχολούμενων.² Επομένως, στη φορολογική βάση του κεφαλαίου, περιλαμβάνεται και το εισόδημα των αυτοαπασχολούμενων.

Επίσης, εκτιμάται μεμονωμένα ο τελικός φορολογικός συντελεστής στο εισόδημα των αυτοαπασχολούμενων (effective tax rate on self-employment income). Επιπλέον, υπολογίζεται ο τελικός φορολογικός συντελεστής στο εισόδημα των επιχειρήσεων (effective tax rate on corporate income).³ Εκτιμάται επίσης ο τελικός φορολογικός συντελεστής της κατανάλωσης (effective tax rate on consumption), ο οποίος ορίζεται ως ο λόγος των συνολικών έμμεσων φόρων προς τη (προ - φόρων) συνολική κατανάλωση της οικονομίας. Τέλος, εκτιμώνται οι (τελικοί) συντελεστές που δείχνουν την επιβάρυνση του εισοδήματος από εργασία για ασφαλιστικές εισφορές (social security contributions).

Με βάση τα αποτελέσματα της μελέτης ο τελικός φορολογικός συντελεστής στη μισθωτή εργασία, ο οποίος εμφανίζει μια ανοδική πορεία μέχρι το 2003, ενώ στη συνέχεια η πορεία του είναι φθίνουσα. Η τιμή του τελικού φορολογικού συντελεστή το 2008 εμφανίζει μια μικρή μείωση σε σχέση με το 2007 κατά 0,22 ποσοστιαίες μονάδες. Το ύψος του τελικού φορολογικού συντελεστή το 2009 είναι 28,9%, σημειώνοντας μια σημαντική πτώση κατά

² Ακολουθώντας τη μεθοδολογία της Eurostat, τα έσοδα από τη φορολόγηση του εισοδήματος των αυτοαπασχολούμενων περιλαμβάνονται σε αυτά του κεφαλαίου, καθώς θεωρείται ότι η επιχειρηματική δράση των αυτοαπασχολούμενων εμπεριέχει κινδύνους απώλειας εισοδήματος (risk of losses).

³ Ο τελικός φορολογικός συντελεστής αναφέρεται σε επιχειρήσεις που είναι νομικά πρόσωπα. Το εισόδημα των επιχειρήσεων αυτών περιλαμβάνεται και στη φορολογική βάση του κεφαλαίου.

τρεις ποσοστιαίες μονάδες σε σύγκριση με το 2008. Ένας από τους λόγους για τη μείωση του τελικού φορολογικού συντελεστή είναι η μείωση των ασφαλιστικών εισφορών.⁴ Αξίζει να σημειωθεί ότι σε αντίθεση με την Ελλάδα, στις περισσότερες χώρες της Ευρωζώνης παρατηρήθηκε μια σημαντική αύξηση στις ασφαλιστικές εισφορές την περίοδο 2008-2009, η οποία είναι αποτέλεσμα της λήψης μέτρων για την προφύλαξη της αγοράς εργασίας από την οικονομική κρίση.⁵ Τέλος, αναφέρεται ότι ο μέσος όρος του τελικού φορολογικού συντελεστή στην Ελλάδα την περίοδο 2000-2008 είναι 33%, κοντά στο μέσο όρο της Ευρωζώνης, ο οποίος είναι 34%.

Επιπλέον, παρατηρείται ότι ο τελικός φορολογικός συντελεστής του κεφαλαίου παρουσιάζει φθίνουσα πορεία από το 2000 μέχρι το 2004, ενώ τα τελευταία έτη χαρακτηρίζεται από μια περίοδο σταθερότητας. Το ύψος του συντελεστή το 2009 είναι 17,2%, παρουσιάζοντας μια μικρή αύξηση κατά 0,28 ποσοστιαίες μονάδες σε σχέση με το 2008. Σε σύγκριση με το μέσο όρο της Ευρωζώνης, ο τελικός φορολογικός συντελεστής του κεφαλαίου στην Ελλάδα την περίοδο 2000-2008 είναι συστηματικά χαμηλότερος κατά περίπου οκτώ ποσοστιαίες μονάδες.

Ο τελικός φορολογικός συντελεστής στην κατανάλωση (έμμεσοι φόροι) παρουσιάζει μια φθίνουσα πορεία μετά το 2002, η οποία ανακόπτεται το 2005. Το 2008 παρατηρείται μια μείωση του συντελεστή σε σύγκριση με το 2007 κατά 0,42 ποσοστιαίες μονάδες. Ενδιαφέρον είναι ότι το 2008 ο τελικός φορολογικός συντελεστής στην κατανάλωση μειώθηκε σχεδόν σε όλες τις χώρες Ευρωζώνης λόγω της αρνητικής επίδρασης της οικονομικής κρίσης στα έσοδα από έμμεση φορολογία. Το ύψος του τελικού φορολογικού συντελεστή το 2009 στην Ελλάδα είναι 13,9% και σε σχέση με το 2008 παρουσιάζει μια σημαντική πτώση κατά 1,39 ποσοστιαίες μονάδες. Όπως συμβαίνει και με τον τελικό φορολογικό συντελεστή του κεφαλαίου, ο τελικός φορολογικός συντελεστής στην κατανάλωση είναι διαχρονικά χαμηλότερος από το μέσο όρο της Ευρωζώνης. Πιο συγκεκριμένα, ο μέσος όρος του τελικού φορολογικού συντελεστή την περίοδο 2000-2008 είναι 15,6% στην Ελλάδα, ενώ στην

⁴ Οι ασφαλιστικές εισφορές ως ποσοστό του ΑΕΠ το 2009 μειώθηκαν κατά 8,7% συγκριτικά με το 2008. Εκτός από τη μείωση των ασφαλιστικών εισφορών, στη μείωση του τελικού φορολογικού συντελεστή της εργασίας συντέλεσε και η πτώση του εισοδήματος από εργασία, η οποία λόγω του προοδευτικού χαρακτήρα του φορολογικού συστήματος οδήγησε σε αναλογικά μεγαλύτερη μείωση των εσόδων από τη φορολόγηση της εργασίας.

⁵ Βλέπε European Commission (2010a).

Ευρωζώνη είναι 20%.⁶ Επιπλέον, στην Ελλάδα παρουσιάζει έντονες αυξομειώσεις, γεγονός που ίσως αποτελεί ένδειξη του αποσπασματικού χαρακτήρα του φοροεισπρακτικού μηχανισμού.

Η πορεία του τελικού φορολογικού συντελεστή στο εισόδημα των αυτοαπασχολούμενων (ελεύθεροι επαγγελματίες) είναι γενικά αυξητική. Το ύψος του συντελεστή το 2009 είναι 15,4%, παρουσιάζοντας μια μικρή αύξηση κατά 0,23 ποσοστιαίες μονάδες συγκριτικά με το 2008. Αξίζει να επισημανθεί ότι ο τελικός φορολογικός συντελεστής στο εισόδημα των αυτοαπασχολούμενων είναι περίπου δύο φορές χαμηλότερος από τον τελικό φορολογικό συντελεστή της εργασίας, γεγονός που καταδεικνύει μια άνιση κατανομή του φορολογικού βάρους μεταξύ των αυτοαπασχολούμενων και των μισθωτών. Παράλληλα, το ύψος του τελικού φορολογικού συντελεστή στο εισόδημα των αυτοαπασχολούμενων στην Ευρωζώνη είναι 29%, περίπου 14 ποσοστιαίες μονάδες υψηλότερος από αυτόν στην Ελλάδα.

Ο τελικός φορολογικός συντελεστής στο εισόδημα των επιχειρήσεων παρουσιάζει έντονες διακυμάνσεις τόσο στην Ελλάδα όσο και στην Ευρωζώνη. Το 2009 το ύψος του φορολογικού συντελεστή στην Ελλάδα είναι 19%, παρουσιάζοντας μια σημαντική αύξηση κατά 2,27 ποσοστιαίες μονάδες συγκριτικά με το 2008. Ο μέσος όρος του συντελεστή την περίοδο 2000-2008 είναι περίπου 21% στην Ελλάδα, ενώ στην Ευρωζώνη είναι περίπου 24%.

Το 2009 ο συντελεστής επιβάρυνσης του εισοδήματος της μισθωτής εργασίας για ασφαλιστικές εισφορές σημείωσε σημαντική πτώση κατά τρεις ποσοστιαίες μονάδες σε σχέση με το 2008, με αποτέλεσμα να διαμορφωθεί στο 22,5%. Ο μέσος όρος για την περίοδο 2000-2009 είναι περίπου 26,6% στην Ελλάδα, ενώ στην Ευρωζώνη είναι περίπου 25,7%. Ο τελικός συντελεστής που αφορά εισφορές που επιβαρύνουν τους εργοδότες (12,5% το 2009) είναι υψηλότερος από αυτόν που επιβαρύνει τους μισθωτούς (10%) Στην Ευρωζώνη, ο συντελεστής που αναφέρεται στην επιβάρυνση των εργοδοτών από ασφαλιστικές εισφορές το 2009 είναι 16,7%, ενώ ο αντίστοιχος συντελεστής για τους εργαζόμενους είναι 8,7%. Με άλλα λόγια, η επιβάρυνση των μισθωτών ως προς την πληρωμή των ασφαλιστικών εισφορών, είναι μεγαλύτερη στην Ελλάδα συγκριτικά με την Ευρωζώνη. Αντίθετα, η επιβάρυνση των εργοδοτών στην Ελλάδα σε σχέση με την Ευρωζώνη είναι μικρότερη.

⁶ Αξίζει να σημειωθεί ότι η Ελλάδα και η Ισπανία είναι οι χώρες με τους χαμηλότερους τελικούς φορολογικούς συντελεστές στην κατανάλωση για την περίοδο 2000-2008.

Τέλος, ο τελικός συντελεστής που αφορά ασφαλιστικές εισφορές των αυτοαπασχολούμενων ήταν 7,8% το 2009, σημαντικά χαμηλότερος από τον αντίστοιχο συντελεστή που αφορά ασφαλιστικές εισφορές στη μισθωτή εργασία.

Από την παραπάνω ανάλυση προκύπτουν σημαντικές διαφορές μεταξύ των τελικών φορολογικών συντελεστών, συνεπώς και της κατανομής του φορολογικού βάρους μεταξύ των διαφόρων πηγών εισοδήματος. Συγκεκριμένα, η σημαντικότερη διαφορά μεταξύ των φορολογικών συστημάτων της Ελλάδας και της Ευρωζώνης αφορά τον τελικό φορολογικό συντελεστή που επιβαρύνει τους αυτοαπασχολούμενους, όπου στην Ελλάδα είναι σημαντικά χαμηλότερος. Η διαφορά αυτή, ίσως αποτελεί ένδειξη για τον μεγαλύτερο αριθμό των αυτοαπασχολούμενων στην Ελλάδα σε σχέση με τον μέσο όρο της Ευρωζώνης. Επιπλέον, λαμβάνοντας υπόψη ότι το 59% της φορολογικής βάσης του κεφαλαίου αποτελείται από το εισόδημα των αυτοαπασχολούμενων, η χαμηλή τους φορολόγηση δικαιολογεί εν μέρει και το χαμηλό τελικό φορολογικό συντελεστή του κεφαλαίου. Σημαντική διαφορά υπάρχει και στον τελικό φορολογικό συντελεστή της κατανάλωσης, όπου στην Ελλάδα είναι συγκριτικά χαμηλότερος με τον αντίστοιχο συντελεστή της Ευρωζώνης. Ο χαμηλός αυτός συντελεστής, σε συνδυασμό με το χαμηλό τελικό φορολογικό συντελεστή των αυτοαπασχολούμενων, εξηγεί σε κάποιο βαθμό τα χαμηλότερα φορολογικά έσοδα της Ελλάδας έναντι της Ευρωζώνης.

Λαμβάνοντας υπόψη τις παραπάνω διαφορές, μπορούν να διατυπωθούν προτάσεις ως προς την αλλαγή της φορολογικής πολιτικής ώστε να συνεισφέρει στη δημοσιονομική εξυγίανση (fiscal consolidation). Η μεγάλη δημοσιονομική εξυγίανση που απαιτείται στην Ελλάδα δεν μπορεί να επιτευχθεί μόνο μέσω της μείωσης των δημοσίων δαπανών, αλλά επιβάλλει και την αύξηση των φορολογικών εσόδων κατά τρόπο που να μην επιβαρύνει τη δυνατότητα μεγέθυνσης της οικονομίας (growth-friendly tax reforms).

Συγκεκριμένα, αύξηση των φορολογικών εσόδων μπορεί να επιτευχθεί μέσω αύξησης της τελικής (ή αποτελεσματικής) φορολογίας των αυτοαπασχολούμενων, η οποία θα οδηγήσει και στη μείωση της ανισομερούς κατανομής του φορολογικού βάρους μεταξύ μισθωτών και αυτοαπασχολούμενων. Επίσης, η αύξηση των φορολογικών εσόδων είναι δυνατή μέσω αύξησης της τελικής (ή αποτελεσματικής) φορολογίας της κατανάλωσης, η οποία στην Ελλάδα είναι αρκετά χαμηλότερη συγκριτικά με την Ευρωζώνη (με βάση τα διαθέσιμα στοιχεία ως το 2009). Τα δύο παραπάνω, δεν προϋποθέτουν απαραίτητως αύξηση των

ονομαστικών φορολογικών συντελεστών, καθώς μπορούν να επιτευχθούν μέσω του περιορισμού της φοροδιαφυγής και της εισφοροδιαφυγής.

Τέλος, λαμβάνοντας υπόψη τη σχετικά υψηλότερη φορολογική επιβάρυνση στο εισόδημα από εργασία, μετακίνηση του φορολογικού βάρους από την εργασία στην κατανάλωση, μπορεί μέσω της θετικής επίδρασης στην απασχόληση να οδηγήσει σε αύξηση του εισοδήματος της οικονομίας και κατ' επέκταση στη μείωση του δημοσίου χρέους ως ποσοστό του ΑΕΠ.⁷

Ωστόσο, θα πρέπει να τονιστεί ότι οι επιπτώσεις και η αποτελεσματικότητα των παραπάνω προτάσεων εξαρτάται και από τα επιμέρους χαρακτηριστικά της Ελληνικής οικονομίας, όπως είναι η αποτελεσματικότητα και η αποδοτικότητα της φορολογικής διοίκησης.

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Effective tax rates in Greece

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Abstract

This study estimates the effective tax rates for various sources of income for Greece. The results show that the effective tax rates on income from capital and self-employment, as well as on consumption, are lower in Greece than in the other Euro Area countries. Furthermore, based on the results, specific tax policy changes are proposed. The proposals aim at contributing to the fiscal consolidation of Greece through increasing tax revenues in a growth-friendly manner.

1 Introduction

The aim of the study is to: a) provide updated estimates for the effective tax rates of the Greek economy and conduct comparisons with the corresponding effective tax rates of the Euro Area, and b) suggest tax policies that can contribute to the fiscal consolidation of Greece.

A common approach to examine the evolution and the distribution of tax burden is to construct tax indicators, such as effective tax rates.⁷ In general, effective tax rates are calculated as the ratios between the tax revenues from particular taxes and the corresponding tax bases, using information provided by National Accounts. Effective tax rates are indicators

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⁷ For a review of the literature see e.g. Carey-Tchilinguirian (2000), Martinez – Mongay (2000) and Papageorgiou (2009).

that incorporate the full information of a tax system (tax exemptions, discounts etc.) and the efficiency of the tax administration system. They also provide indications as to the distribution of the effective tax burden among economic agents and various sources of income. Moreover, to the extent that these rates reflect changes in tax policies, they can be utilised to examine the real impact of such changes on economic activity.

2 Methodology

We follow Mendoza *et al.* (1994) and construct effective tax rates using pre-tax and post-tax income and prices.⁸ This methodology produces effective tax rates that correspond to realised average tax ratios.

2.1 The Model

This sub-section sketches the model of Mendoza *et al.* (1994). Consider an economy with three goods, consumption (c), labour (l) and capital (k). In this economy, households decide how much to consume and how much capital and labour to supply to firms that produce the consumption good. Firms use labour and capital as inputs. Households' consumption allocations of each good are denoted by the vector $h = (h_c, h_l, h_k)$. Government sets exogenous policies with respect to expenditures in each good, denoted by the vector $g = (g_c, g_l, g_k)$. The government finances its policies by levying taxes on consumption, labour and capital.

There are two price vectors, the consumer post-tax price vector $p = (p_c, p_l, p_k)$ and the producer pre-tax price vector $q = (q_c, q_l, q_k)$. Typically, $p_c > q_c$, i.e. the post-tax price of consumption is higher than the pre-tax price, while $p_l < q_l$ and $p_k < q_k$ since the post-tax price on labour and capital are lower than the pre-tax price. Tax policy is characterized by a vector of specific tax rates $t = (t_c, t_l, t_k)$ per unit of the corresponding good. The specific tax rate is the difference between pre and post-tax prices, $t = p - q$, and the corresponding vector

⁸ Mendoza *et al.* (1994) essentially developed suggestions by Lucas (1990) and Razin and Sadka (1993) to relate realised tax revenues directly to the relevant macroeconomic variables in the National Accounts.

of *ad valorem* tax rate is $\tau = (\tau_c, \tau_l, \tau_k)$, where $\tau_i = \frac{t_i}{q_i} = \frac{p_i - q_i}{q_i}$, $i = c, l, k$. Prices p and q are not readily available and it is easier to approximate measures of tax rates by multiplying t_i and q_i times an appropriate quantity measure, thus using data on tax revenues and tax bases rather than price data. The appropriate quantity measures are obtained by examining the household's budget constraint:

$$p(h - e - b) + p_c D = q \times y \quad (1)$$

where $e = (e_c, e_l, e_k)$ and $b = (b_c, b_l, b_k)$ are vectors that represent possible endowments and government transfers of the three goods, $y = (y_c, y_l, y_k)$ is the net output vector and $p_c D$ is a lump-sum consumption tax. The net consumption vector to which the tax rate t applies is $(h - e - b)$. The consumption vectors for l and k are negative, while $b_l = 0$ since the government cannot make transfers in labour units. That is, $(h_l - e_l)$ and $(h_k - e_k - b_k)$ are negative, i.e. $(e_l - h_l)$ and $(e_k + b_k - h_k)$ represent the labour and capital supply from households, respectively. $y_c > 0$ measures the net output of the consumption good by the private sector and $y_l < 0$, $y_k < 0$ corresponds to the production inputs. It follows that $q \times y$ measures profits which are part of the household's income. Thus, the *ad valorem* tax rates for this economy according to Mendoza *et al.* (1994) are:

$$\tau_c = \frac{p_c y_c - q_c y_c}{q_c y_c} = \frac{(p_c - q_c) y_c}{q_c y_c} \quad (2)$$

$$\tau_l = \frac{q_l (e_l - h_l) - p_l (e_l - h_l)}{q_l (e_l - h_l)} = \frac{(q_l - p_l) (e_l - h_l)}{q_l (e_l - h_l)} \quad (3)$$

$$\tau_k = \frac{-q_k y_k - (-p_k y_k)}{-q_k y_k} = \frac{(q_k - p_k) y_k}{q_k y_k} \quad (4)$$

The numerators in the above equations measure the difference between post-tax and the pre-tax valuation of consumption, labour and capital income respectively, which can be directly approximated by measures of tax revenues derived from each tax. The denominators of the above equations are measures of consumption, labour income and capital income valued at pre-tax prices and correspond to the measures of the tax base. Thus, the key issue for the estimation of the vector τ is the determination of tax revenues and tax bases that reflect the corresponding measures of post-tax and pre-tax valuation of income and expenditures. The corresponding tax rate for each good is the ratio of total tax revenues from the taxation of each good to the pre-tax value of consumption, labour income and capital income respectively.

Finally, the method described here produces aggregate effective tax rates that correspond to realized average tax rates. These tax rates aggregate the information on statutory taxes, credits, deductions and exemptions implicit in national accounts in a manner that captures the overall tax burden from each tax and maintains consistency with the representative agent framework.

2.2 Data sources

For the calculation of the effective tax rates, data from Eurostat and the OECD were used. The data set comprises of annual data and covers the period 2000-2009. The data for the effective tax rates of the Euro Area are based on authors estimations, European Commission (2010) and Kollintzas, Papageorgiou and Vasilatos (2010) and refer to the 2000-2008 period.⁹

The four-digit codes listed below identify different measures of tax revenue and correspond to the codes used in the OECD Revenue Statistics. Also listed below, are variables from Eurostat and OECD National Accounts and OECD Economic Outlook No 88.¹⁰

9 While Eurostat's methodology to estimate effective rates is generally based on Mendoza *et al.* (1994), the main difference is that Eurostat uses additional information to split labour and capital tax revenues from personal income taxation. In this paper, we follow the approach of Mendoza *et al.* (1994) (see below in section 2.3.2 for details). Nevertheless, the results presented in this paper are directly comparable with Eurostat's estimates both in qualitative and quantitative terms (see e.g. Forni *et al.* (2009) and Carey-Tchilinguirian (2000) for a comparison of different approaches for estimating effective tax rates).

10 The definitions of the variables used in this section are taken from OECD (2004), OECD (2006) and OECD (2007). See also <http://www.oecd.org/ctp/revenuestats>.

Revenue Statistics

1100 = Taxes on income, profits and capital gains of individuals or households
1200 = Taxes on income, profits and capital gains of corporations
4100 = Recurrent taxes on immovable property¹¹
4300 = Estate, inheritance and gift taxes
4400 = Taxes on financial and capital transactions¹²
5212 = Motor vehicle taxes paid by corporations
5110 = General taxes on goods and services
5121 = Excise taxes
5126 = Taxes on specific services¹³
SSCEM = Social security contributions paid by the employees
SSCER = Social security contributions paid by the employers
SSCSE = Social security contributions paid by the self-employed and unemployed

National Accounts

C = Private final consumption expenditure
GCNW = Government final non-wage consumption expenditure
COMP = compensation of employees (dependent employment)
GOS = gross operating surplus (total economy)
GOSH = gross operating surplus and mixed income of households¹⁴
GOSC = gross operating surplus of corporations
CFC = consumption of fixed capital (total economy)
HCFC = households consumption of fixed capital
CFCC = consumption of fixed capital (corporations)
YPE = Property income received by households¹⁵
YSE = *GOSH* - *HCFC* = net self-employment income

11 This covers taxes levied regularly in respect of the use or the ownership of immovable property. These taxes are levied on land and building, in the form of a percentage of an assessed property value based on a national rental income, sales prices, or capitalized yield and are paid both by households and corporations (OECD, 2007).

12 This includes taxes on the issue, transfer, purchase and sale of securities, taxes on cheques and taxes levied on specific legal transactions such as validation of contracts and the sale of immovable property, taxes on capital gains resulting from the sale of a property etc (OECD, 2007).

13 This includes all taxes assessed on the payment of specific services, such as taxes on insurance premiums, banking services, gambling and betting stakes, transport, entertainment (OECD, 2007).

14 The gross operating surplus of households is the surplus or deficit accruing from production by unincorporated enterprises owned by households. It implicitly contains an element of work done by the owner that cannot separately identified from the return to the owner as entrepreneur. An unincorporated enterprise is a producer unit which is not incorporated as a legal entity separate from the owner. The fixed and other assets used in unincorporated enterprises do not belong to the enterprises but to their owners. The owners are personally liable without limit for any debts or obligations incurred in the course of production. In general, the owners of these enterprises are self-employed persons (see OECD, 2006; OECD, 2004).

15 Includes mainly dividends, interest and investment receipts (OECD, 2004).

2.3 Construction of effective tax rates

In the following sub-sections, the methodology used to calculate each individual effective tax rate is described in detail.

2.3.1 Effective tax rate on consumption

The effective tax rate on consumption corresponds to the difference between the post-tax consumer price and the pre-tax price at which firms supply the consumption good. Thus, the effective tax rate on consumption is:

$$\tau_c = \frac{5110 + 5121 + 5126}{C + GCNW - (5110 + 5121 + 5126)} \quad (5)$$

The numerator of the above equation is the tax revenues from indirect taxation which includes general taxes on goods and services (5110) plus excise taxes (5121), plus taxes on specific services (5126). The total tax revenue from indirect taxation by definition is equal to the difference between the nominal value of aggregate consumption at post-tax and pre-tax prices. The denominator is the base of the consumption tax, which is the pre-tax value of consumption. The latter is measured as post-tax consumption expenditures minus the revenue from indirect taxation. Note that nominal consumption expenditures are at post-tax prices in the National Accounts. Thus, by subtracting from the post-tax value of consumption ($C + GCNW$) the difference between the post and pre-tax value of consumption ($5110 + 5121 + 5126$) which corresponds to tax revenue from indirect taxation, we obtain the pre-tax value of consumption.¹⁶

2.3.2 Effective tax rate on employed labour income

One problem with the computation of the effective tax rate on employed labour income is that tax revenue data does not provide a breakdown of tax revenue from individual labour and capital income. This is because data code 1100 corresponds to tax revenues from the taxation

¹⁶ Government non-wage consumption is included in the denominator because Revenue Statistics reports data on indirect tax revenue that includes taxes paid by government. However, this applies only for purchases of goods and services and not for wages of the government employees; see also Mendoza *et al.* (1994).

of both labour and capital income of households. In order to decompose tax revenue from labour and capital income of households, we follow Mendoza *et al.* (1994) and assume that all sources of households' income, namely labour and capital income, are taxed at the same rate. Thus, the first step in calculating the effective tax rate on labour income is to compute a personal income tax rate that applies both to labour and capital income of the household. The personal income tax rate is:

$$\tau_h = \frac{1100}{(COMP + YSE + PEI) - (SSCER + SSCEM + SSCSE)} \quad (6)$$

The representative households' personal income tax rate is the ratio of total tax revenue from individual taxation (1100) – which represents the difference between post-tax and pre-tax household income – to total pre-tax household income, which is the sum of total compensation of employees (*COMP*), self-employment and property income received by households (*YSE + PEI*), minus social security contributions paid by the employees, employers and the self-employed. Social security contributions are deducted from the tax base since these contributions are not taxed at the personal level in Greece.

Given the above, labour income tax revenues from personal income tax on net wages are $\tau_h (COMP - SSCEM - SSCER)$. Thus, the effective tax rate on employed labour income is then constructed as:

$$\tau_l = \frac{\tau_h (COMP - SSCEM - SSCER) + SSCER + SSCEM}{COMP} \quad (7)$$

In addition to the tax revenues from wages, the numerator incorporates social security contributions paid by the employees and the employers (*SSCER + SSCEM*) as part of the revenues from labour income taxes. Thus, the numerator contains all tax revenues from employed labour income taxation and is the difference between the post-tax and pre-tax labour income. The denominator, which is the base of the labour income tax, contains total compensation of employees.

2.3.3 Effective tax rate on capital income

The effective tax rate on capital income is estimated as the ratio of revenues from the taxation of capital income to total capital income. Continuing with the assumption that all sources of household income are taxed under the same personal income tax rate, the tax rate on capital income is constructed by estimating first the revenue from the taxation of households' capital income. Households' capital income is assumed to be the net self-employment and property income received by households, minus social security contributions paid by the self-employed ($YSE + PEI - SSCSE$). Note that in line with Mendoza *et al.* (1994), all self-employment income (after the deduction of social security contributions) is treated as capital income.¹⁷ Thus, the revenue from households' capital income tax is $\tau_h(YSE + PEI - SSCSE)$. The effective capital income tax rate is then constructed as:

$$\tau_k = \frac{\tau_h(YSE + PEI - SSCSE) + 1200 + 4100 + 4300 + 4400 + 5212}{GOS - CFC} \quad (8)$$

The numerator, which represents the difference between the post-tax and the pre-tax capital income includes, in addition to households' tax payments on capital income, payments of capital income taxes made by corporations (1200), all recurrent taxes on immovable property paid by households' and others (4100), the revenue from specific taxes on financial and capital transactions (4400), inheritance and gift taxes (4300) and motor vehicle taxes paid by corporations (5212).

The pre-tax capital income, which is the base for the tax, is the net operating surplus of the total economy, $NOS = GOS - CFC$. The net operating surplus is an accounting concept in the National Accounts and is used as proxy for pre-tax capital income or pre-tax profits of the total economy (see also Mendoza *et al.*, 1994).

2.3.4 Effective tax rate on self-employment income

The effective tax rate on the income from self-employment is the ratio of tax revenues from the personal income tax on self-employment income and (net) self-employment income. As

¹⁷ Following Eurostat's methodology, the revenues from the taxation of self-employment income are included in the revenues from the taxation of capital as entrepreneurship is considered to entail a risk of losses. An alternative approach is to treat self-employment income as a combination of labour and capital income by assuming that the self-employed earn an imputed wage (see e.g. Fiorito and Padrini, 2001).

no data is available on taxes paid by the self-employed in the OECD Revenue Statistics, we estimate tax revenues from self-employment income by assuming that all income (excluding social security contributions paid by the self-employed) is taxed at the personal income tax rate, τ_h .¹⁸ The effective tax rate on self-employment income can then be constructed as:

$$\tau_{se} = \frac{\tau_h(YSE - SSCSE) + SSCSE}{YSE} \quad (9)$$

where the numerator contains tax revenues from the personal income tax on self-employment income, $\tau_h(YSE - SSCSE)$, social security contributions paid by the self-employed and the denominator, which is the tax base, contains total net income of self-employed expressed in pre tax values, YSE .

2.3.5 Effective rate related to social security contributions (employees and 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 also calculated. This rate is calculated for total labour income as follows:

$$\tau_{ssc} = \frac{SSCER + SSCEM}{COMP} \quad (10)$$

The effective rate related to social security contributions can be decomposed into the part that burdens the income of employees and that which burdens the income of employers. 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:

$$\tau_{ssc-em} = \frac{SSCEM}{COMP} \quad (11)$$

¹⁸ Eurostat, provides tax revenues from the personal income tax on 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. We choose to estimate the effective tax rate on self-employment income as in (9), so that our results to be comparable with those in Kollintzas *et al.* (2010).

while the respective rate for employers is:

$$\tau_{ssc_er} = \frac{SSCER}{COMP} \quad (12)$$

2.3.6 Effective rate related to social security contributions (self-employment)

The (effective) rate regarding social security contribution payments that burdens the income from self-employment can be calculated as follows:

$$\tau_{ssc_self} = \frac{SSCSE}{YSE} \quad (13)$$

2.3.7 Effective tax rate on corporate income

In addition, the effective tax rate on corporate income (legal entities) is calculated.¹⁹ The income of such corporations is included in the tax base of capital and can be defined as:

$$\tau_{corp} = \frac{1200 + 5212}{GOSC - CFCC} \quad (14)$$

where the numerator consists of payments on income, profits and capital gains paid by corporations (1200), motor vehicle taxes paid by corporations (5212) and the denominator includes the net operating surplus of corporations.

3 Results

Figure 1 presents the evolution of the effective tax rates for Greece over the period 2000-2009. Sub-figure 1 displays the effective tax rate on employment income, which has an upward trend until 2003 and declines thereafter. The level of the effective tax rate in 2008 has slightly decreased compared to 2007 by 0.22 percentage points (Table 1). In contrast, the

¹⁹ A corporation in the National Accounts is defined as a form of enterprise having legal identity separate from that of its owners that publishes a complete set of accounts recording the value of its financial and non-financial wealth (OECD, 2004).

level of the effective tax rate in 2009 is 28.9%, three percentage points lower compared to 2008. This reduction can be mainly attributed to the decreased social security contributions.²⁰

It is worth noting that, in contrast with Greece, in most Euro Area countries there was a significant increase in social security contributions over the period 2008-2009. This is due to the measures taken by governments for the protection of the labour market from the global economic crisis.²¹ Finally, the average value of the effective tax rate over the period 2000-2008 in Greece was calculated at 33% that is close to the Euro Area average (34%).

From sub-figure 2 it is evident that the effective tax rate of capital has significantly decreased from 2000 to 2004, while the rate is relatively stable during the latter years. The level of this rate in 2009 is estimated at 17.2%, which is slightly increased from 2008 by 0.28 percentage points. Compared to the Euro Area average, the average effective tax rate of capital in Greece is systematically lower by about eight percentage points during the 2000-2008 period.

The effective tax rate on consumption exhibits a decreasing trend during the 2002-2005 period (sub-figure 3). In 2008 this rate decreased by 0.42 percentage points compared to 2007. An interesting fact is that in 2008, the effective tax rate on consumption decreased in almost all Euro Area countries due to the negative impact of the global economic crisis on indirect tax revenues. In 2009, this rate was 13.9% in Greece, which is significantly decreased from 2008 by 1.39 percentage points. Similarly, the effective tax rate on consumption is systematically lower in Greece vis-à-vis the Euro Area. Specifically, the average value of this rate is 15.6% for Greece and 20% for the Euro Area over the 2000-2008 period.²² Moreover, it is highly volatile in Greece which is perhaps a manifestation of the fragmented nature of the tax administration system.

From sub-figure 4 it can be observed that the effective tax rate on self-employment income is generally increasing. The level of the rate in 2009 is 15.4%, which is a marginal increase of 0.23 percentage points compared to 2008. It is worth noting, that the effective tax rate on self-employed income is about two times lower than the rate on employed income, which signifies an uneven distribution of the overall tax burden between income from self-

20 The social security contributions in 2009 decreased by 8.7% of GDP compared to 2008. In addition to the decreases in social security contributions, the reduction of the effective tax rate on labour is also attributed to the fall of labour income, which, due to the progressive tax system in Greece, leads to an even larger proportional decrease of tax revenues from labour income.

21 See European Commission (2010a).

22 Greece and Spain have the lowest effective tax rates on consumption throughout the 2000-2008 period.

employment and labour (dependent employment). Furthermore, the level of the effective tax rate on self-employed income in the Euro Area is 29%, about 14 percentage points higher than that of Greece.

The effective tax rate on corporate income is highly volatile in both Greece and the Euro Area (sub-figure 5). The average rate for the period 2000-2008 is 21% and 24% respectively. In 2009 the rate for Greece is 19%, which is a significant increase of 2.27 percentage points when compared to 2008.

Sub-figure 6 depicts the (effective) rates indicating the burden on labour income related to social security contributions. In 2009 the rate is 22.5% signifying a large decrease by three percentage points compared to 2008. The average value over the period 2000-2009 is 26.6% for Greece and 25.7% for the Euro Area countries. This overall rate is further decomposed to the burden on employers (sub-figure 7) and employees (sub-figure 8). The burden on employers (12.5% in 2009) is higher than on employees (10%). In the Euro Area, the effective rate for employers in 2009 is 16.7%, while the corresponding rate for employees is 8.7%. In other words, although the burden for the payment of social security contributions differs between employers and employees in both Greece and the Euro Area, the burden for employees in Greece is higher but it is lower for the employers. Finally, sub-Figure 9 shows burden on self-employment income related to social security contributions. The rate in 2009 is 7.8%, which is significantly lower than the corresponding rate on labour income.

4 Conclusions

The above analysis indicates that there are considerable differences amongst the effective tax rates, and therefore the allocation of the tax burden between different sources of income, when comparing Greece and the Euro Area. In particular, the largest difference between the tax systems of Greece and the Euro Area countries concerns the effective tax rate on self-employment income, which in Greece is significantly lower. This difference perhaps explains the higher number of self-employed in Greece vis-à-vis the Euro Area. Moreover, as 59% of the capital income tax base in Greece consists of self-employment income, their low taxation partially justifies the low effective tax rate on capital. A notable difference is also evident when considering the effective tax rate on consumption, which in Greece is quite lower than

the corresponding Euro Area average rate. This low rate, combined with the low rate on the self-employed, might explain to some extent Greece's lower aggregate tax revenues compared to the Euro Area.

Based on the above results, specific proposals regarding changes in Greece's tax policies can be considered. The sizable fiscal consolidation required in Greece, cannot be achieved only through the reduction of public expenditure, but also requires an increase of tax revenues in a growth-friendly manner. In particular, an increase of tax revenues can be accomplished by increasing the effective taxation of self-employment income that would also lead to a reduction of the uneven distribution of the tax burden between income from self-employment and labour. Tax revenues can also be increased by raising the effective taxation of consumption, which in Greece are much lower than the Euro Area (based on data available until 2009). *These proposals do not necessarily imply increases in statutory tax rates, as the end result of increased tax revenues can also be achieved through the reduction of tax evasion and tax avoidance.*

Finally, given the high tax burden on income from labour (dependent employment), shifting part of the tax burden from labour to consumption will increase employment and output growth, and thereby lead to a reduction of public debt as a percentage of GDP.²³ However, it must be stressed that the impact and effectiveness of the above proposals depend on the individual characteristics of the Greek economy, such as the effectiveness and the efficiency of tax administration system.

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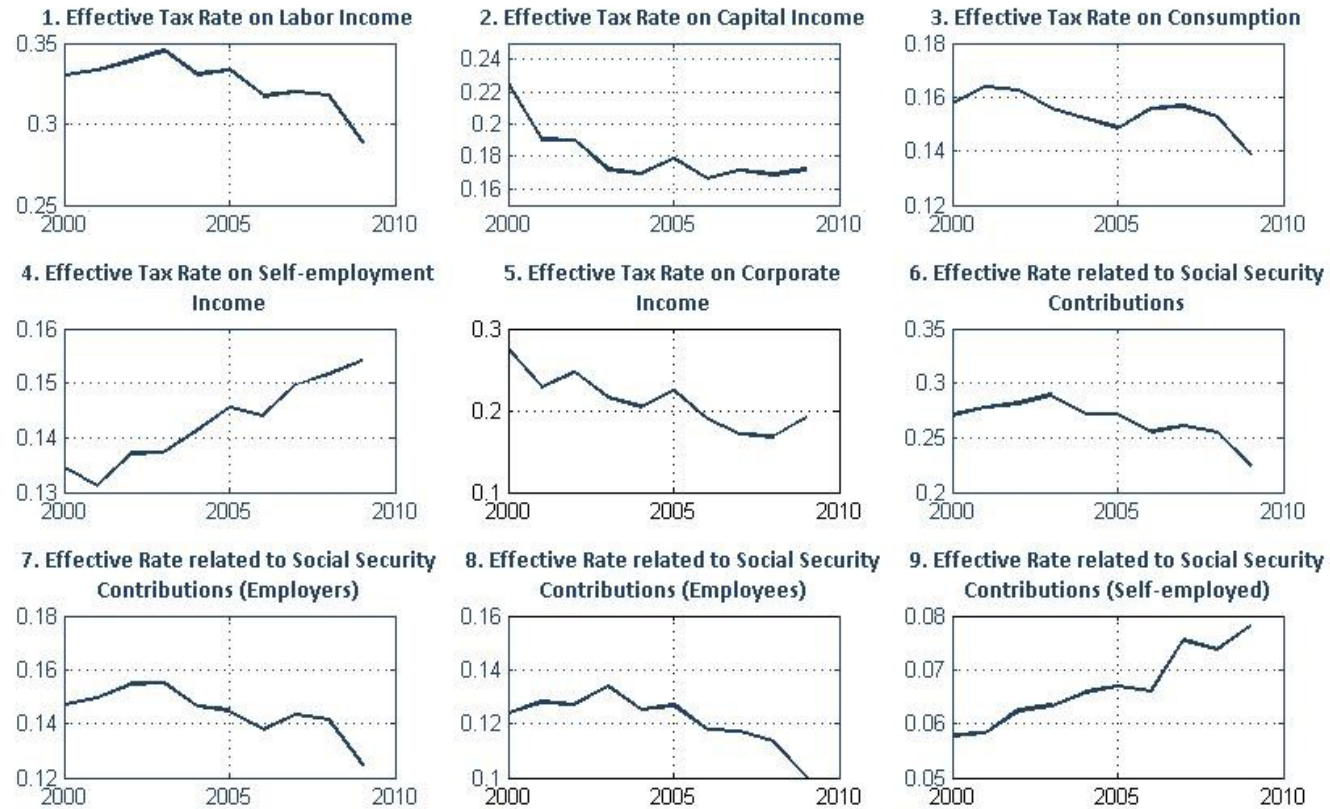
Table 1: Effective tax rates in Greece (%)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Labour income (τ_l)	33.0	33.3	33.9	34.5	33.1	33.3	31.8	32.0	31.8	28.9
Capital income (τ_k)	22.6	19.1	19.0	17.2	16.9	17.9	16.6	17.2	16.9	17.2
Consumption (τ_c)	15.8	16.4	16.3	15.6	15.2	14.9	15.6	15.7	15.3	13.9
Self-employment income (τ_{se})	13.5	13.1	13.7	13.7	14.1	14.6	14.4	15.0	15.2	15.4
Corporate income (τ_{corp})	27.5	22.9	24.7	21.5	20.5	22.4	19.0	17.1	16.8	19.1
Social security contributions labour income (a+b) (τ_{ssc})	27.1	27.7	28.2	28.9	27.2	27.2	25.5	26.1	25.5	22.5
- a. Social security contributions – burden on employees ($\tau_{ssc\ em}$)	12.4	12.8	12.7	13.4	12.5	12.7	11.8	11.7	11.3	10.0
- b. Social security contributions – burden on employers ($\tau_{ssc\ er}$)	14.7	15.0	15.5	15.5	14.6	14.5	13.8	14.3	14.2	12.5
Social security contributions – self-employed ($\tau_{ssc\ self}$)	5.8	5.8	6.2	6.3	6.6	6.7	6.6	7.6	7.4	7.8

Notes:

- The revenues from the taxation of capital income consist mostly of taxes on financial and capital transactions (e.g. taxes on the issue, transfer, purchase and sale of securities, taxes on capital gains resulting from the sale of a property), recurrent taxes on net wealth and on immovable property, taxes on estates and inheritances etc. It is important to note that the tax revenues from capital income also include revenues from taxation of self-employment income.
- The effective tax rate on corporate income refers to companies that are legal entities. The income of such corporations is included in the tax base of capital.

Figure 1: Effective tax rates in Greece



- The revenues from the taxation of capital income consist mostly of taxes on financial and capital transactions (e.g. taxes on the issue, transfer, purchase and sale of securities, taxes on capital gains resulting from the sale of a property), recurrent taxes on net wealth and on immovable property, taxes on estates and inheritances etc. It is important to note that the tax revenues from capital income also include revenues from taxation of self-employment income.

- The effective tax rate on corporate income refers to companies that are legal entities. The income of such corporations is included in the tax base of capital.

- Sub-figures 6-9 refer to rates indicating the burden on income related to social security contributions. Sub-figures 7 and 8 are the components of the rate of sub-figure 6.

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