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**ΠΟΣΟΤΙΚΗ ΕΚΤΙΜΗΣΗ ΤΟΥ ΕΦΙΚΤΟΥ ΛΟΓΟΥ  
ΜΗ ΕΡΓΑΖΟΜΕΝΩΝ – ΕΡΓΑΖΟΜΕΝΩΝ.  
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**ΕΛΕΝΗ ΓΚΡΟΖΑ**

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Με ιδιαίτερη χαρά θα ήθελα να ευχαριστήσω τον επιβλέποντα καθηγητή μου κ. Θεόδωρο Μαριόλη. Η βοήθεια και η καθοδήγησή του αποτέλεσαν σημαντικά στοιχεία για την κατανόηση του αντικειμένου και την συγγραφή της εργασίας, ενώ οι συμβουλές του στον τρόπο αντιμετώπισης των διαφόρων ζητημάτων που εμφανίστηκαν ήταν καθοριστικής σημασίας για να επιτευχθεί το επιθυμητό αποτέλεσμα. Επίσης, θα ήθελα να ευχαριστήσω το διδακτορικό φοιτητή κ. Γεώργιο Σώκλη για τη συστηματική βοήθειά του κατά τη διάρκεια της μελέτης του αντικειμένου της εργασίας, καθώς επίσης και για την αναλυτική παρουσίαση και παραχώρηση των εμπειρικών δεδομένων που ήταν απαραίτητα για όλους τους υπολογισμούς, ήτοι των Συμμετρικών Πινάκων Εισροών – Εκροών της Ελληνικής Οικονομίας για τα έτη 1997 – 1998.

Ελένη Γκρόζα

## Περίληψη

Η παρούσα εργασία εκτιμά ποσοτικά τον εφικτό λόγο μη εργαζομένων – εργαζομένων, στα πλαίσια, πρώτον, μιας κλειστής οικονομίας η οποία χαρακτηρίζεται από έναν διατομεακά ενιαίο ρυθμό μεγέθυνσης, και δεύτερον, μίας ανοικτής και μη αναλογικά μεγεθυνόμενης οικονομίας.

Η εκτίμηση βασίζεται σε ένα γραμμικό υπόδειγμα εισροών-εκροών, απλής παραγωγής, ομοιογενούς εργασίας, και κυκλοφορούντος κεφαλαίου. Το εν λόγω υπόδειγμα εφαρμόζεται στους Πίνακες Εισροών-Εκροών της Ελληνικής Οικονομίας για τα έτη 1997 – 1998.

Τα αποτελέσματα της εφαρμογής δείχνουν, τελικά, ότι, και για τα δύο εξεταζόμενα έτη, οι τιμές του λόγου μη εργαζομένων – εργαζομένων, οι οποίες κυμαίνονται στην περιοχή του 1.5 με 2 (εάν όχι υψηλότερο επίπεδο) δεν θα πρέπει να θεωρούνται ως τεχνικο-κοινωνικά ανέφικτες.

Εάν και η εργασία δεν πραγματεύεται, ρητά, ζητήματα οικονομικής πολιτικής, είναι σαφές ότι η παρούσα μέτρηση συνιστά έναν πρώτο, αλλά μάλλον βασικό, προσδιορισμό των ορίων που αντικειμενικά υφίστανται για την άσκηση κοινωνικής πολιτικής, γενικά, και των ορίων του συστήματος κοινωνικής ασφάλισης, ειδικά.

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## Εισαγωγή

Σκοπός της παρούσης μελέτης είναι η ποσοτική εκτίμηση του εφικτού λόγου μη εργαζομένων – εργαζομένων (εφεξής: λόγου εργασίας) στηριζόμενοι σε εμπειρικούς πίνακες εισροών – εκροών για την ελληνική οικονομία των ετών 1997 και 1998. Για να προσδιοριστεί ο λόγος, βασιζόμαστε σε ένα γραμμικό υπόδειγμα, απλής παραγωγής, χωρίς πάγιο κεφάλαιο, στο οποίο η ομοιογενής εργασία αποτελεί τη μοναδική αρχική εισροή και οι μισθοί καταβάλλονται εξολοκλήρου στο τέλος της ενιαίας περιόδου παραγωγής.

Στο πρώτο κεφάλαιο της εργασίας αναλύουμε θεωρητικά το βασικό υπόδειγμα σε δύο επίπεδα: 1) στο μάλλον *αφηρημένο* πλαίσιο μιας κλειστής οικονομίας, η οποία μεγεθύνεται με έναν ενιαίο, διατομεακά, ρυθμό, και 2) στο πιο *ρεαλιστικό* πλαίσιο μιας ανοικτής οικονομίας.

Στο δεύτερο κεφάλαιο της εργασίας εφαρμόζουμε το υπόδειγμα. Συγκεκριμένα, βάσει των πινάκων εισροών – εκροών, υπολογίζουμε τα βασικά μεγέθη του υποδείγματος που απαιτούνται για να εκτιμήσουμε ποσοτικά το λόγο. Αυτά είναι: 1) η μήτρα των τεχνολογικών συντελεστών, 2) το διάνυσμα της εργασίας, η οποία από ετερογενής, όπως πράγματι είναι, μετατρέπεται σε ομοιογενής, 3) το διάνυσμα του πραγματικού ωρομισθίου, και 4) τα διανύσματα των εξαγωγών, εισαγωγών, επενδύσεων και ακαθάριστου προϊόντος.

Στη συνέχεια της μελέτης παραθέτουμε τα αποτελέσματα των μετρήσεων. Ειδικότερα, παρουσιάζουμε δύο πίνακες για τα έτη 1997 και 1998, στο πλαίσιο της κλειστής οικονομίας, και συγκρίνουμε τα αριθμητικά αποτελέσματα που προκύπτουν από τους υπολογισμούς. Επιπλέον, παραθέτουμε δύο ακόμη πίνακες για τα έτη 1997 και 1998 στο πλαίσιο της ανοικτής οικονομίας προσδιορίζοντας το λόγο και συγκρίνοντας τις τιμές που υπολογίζονται.

Τέλος, αξιολογούμε τα ευρήματα της εργασίας και συνοψίζουμε τα συμπεράσματά της.

## **ΚΕΦΑΛΑΙΟ 1<sup>ο</sup>: ΤΟ ΑΝΑΛΥΤΙΚΟ ΠΛΑΙΣΙΟ**

## Εισαγωγή

Η παρούσα μελέτη στηρίζεται στους συμμετρικούς πίνακες εισροών – εκροών της ελληνικής οικονομίας για τα έτη 1997 – 1998 και επιχειρεί να εκτιμήσει ποσοτικά, στη βάση μίας σειράς υποθέσεων θεωρητικού χαρακτήρα, τον εφικτό λόγο μη εργαζομένων-εργαζομένων.

Ο περιορισμός της μελέτης σε αυτά τα έτη υπαγορεύεται από το αντικειμενικό γεγονός ότι η χρονοσειρά των διαθέσιμων πινάκων εισροών-εκροών της ελληνικής οικονομίας φθάνει έως και το 1998 (ενώ οι πλέον αναλυτικοί διαθέσιμοι πίνακες, ήτοι διαστάσεων  $58 \times 58$ , υφίστανται μόνον για τα έτη 1997 και 1998).

Στα αμέσως ακόλουθα περιγράψουμε το βασικό θεωρητικό υπόδειγμα της μελέτης.

### 1. Το Βασικό Υπόδειγμα

Βασικός στόχος της ανάλυσής μας είναι ο υπολογισμός του εφικτού λόγου μη εργαζομένων - εργαζομένων. Οι κύριες υποθέσεις του υποδείγματος είναι οι εξής:

- I. Θεωρούμε μια κλειστή, κεφαλαιοκρατική οικονομία απλής παραγωγής (single production).
- II. Η οικονομία μεγεθύνεται με έναν διατομεακά ενιαίο ρυθμό  $g$ .
- III. Η εργασία είναι η μοναδική αρχική εισροή του συστήματος, ενώ οι μισθοί καταβάλλονται εξολοκλήρου στο τέλος της εξυποθέσεως ενιαίας περιόδου παραγωγής.
- IV. Η αποταμίευση από μισθούς είναι μηδέν. Τα κέρδη διασπώνται σε εισόδημα των κεφαλαιούχων και, μέσω μεταβιβαστικών πληρωμών, σε εισόδημα των μη εργαζομένων, το οποίο υποτίθεται ότι καταναλώνεται εξολοκλήρου.
- V. Η σύνθεση της κατανάλωσης είναι ενιαία για εργαζόμενους, κεφαλαιούχους και μη εργαζόμενους.
- VI. Το σύστημα φυσικών ποσοτήτων της οικονομίας αποτελείται από τις τέσσερις παρακάτω σχέσεις:



$$X = AX + AgX + C_i L_i + C_p L_i + C_{ii} L_{ii} \quad (1)$$

$$L_i \equiv \ell X \quad (2)$$

$$C_p = c_p C_i, \quad c_p \geq 0 \quad (3)$$

$$C_{ii} = c_{ii} C_i, \quad c_{ii} > 0 \quad (4)$$

όπου  $X$  είναι το διάνυσμα των επιπέδων λειτουργίας του συστήματος,  $A$  η μη διασπώμενη μήτρα των τεχνικών συντελεστών,  $C_i$  το διάνυσμα του πραγματικού ωρομισθίου ή, αλλιώς, της κατανάλωσης των εργαζομένων ανά μονάδα απασχολούμενης εργασίας,  $L_i$ ,  $\ell$  το διάνυσμα των εισροών σε άμεση, ομοιογενή εργασία,  $C_p$  το διάνυσμα της κατανάλωσης των κεφαλαιούχων από τα κέρδη ανά μονάδα απασχολούμενης εργασίας,  $C_{ii}$  το διάνυσμα της κατανάλωσης των μη εργαζομένων ανά μη εργαζόμενο,  $L_{ii}$ , και  $c_p$ ,  $c_{ii}$  θετικά βαθμωτά, τα οποία παριστούν τα ύψη της κατανάλωσης των κεφαλαιούχων και των μη εργαζομένων, αντιστοίχως.<sup>1</sup>

Η εξίσωση  $X = AX + AgX + C_i L_i + C_p L_i + C_{ii} L_{ii}$  συνιστά μία εξειδίκευση του λεγομένου συστήματος φυσικών ποσοτήτων. Συγκεκριμένα, αυτό το σύστημα είναι της μορφής  $X = AX + Y$ , όπου  $Y$  η τελική ζήτηση ή το καθαρό προϊόν, το οποίο διασπάται σε επενδύσεις ( $AXg$ ), από την μία πλευρά, και σε κατανάλωση ( $C_i L_i + C_p L_i + C_{ii} L_{ii}$ ), από την άλλη.

Η σχέση  $L_i = \ell X$  εκφράζει την ποσότητα εργασίας που απασχολείται συνολικά.

<sup>1</sup> Το παρόν υπόδειγμα έχει στηριχθεί πλήρως στο Μαριόλης (2006). Τονίζεται ότι η υπόθεση περί απλής (single) παραγωγής βρίσκεται σε αναντιστοιχία με ό,τι ισχύει στον πραγματικό κόσμο, όπου η συμπαραγωγή (joint production) συνιστά τον κανόνα (βλ. Steedman, 1984). Όμως, απλοποιεί σημαντικά τη διερεύνηση και καθιστά, έτσι, δυνατή την αποφυγή αρκετών περιπλοκών, οι οποίες δεν έχουν ακόμα επιλυθεί πλήρως ούτε καν στο καθαρά θεωρητικό επίπεδο (βλ. π.χ. Kurz and Salvadori, 1995, ch. 8). Έτσι, η παρούσα μέτρηση θα πρέπει να θεωρείται, και από αυτήν την άποψη, ως μία πρώτη προσπάθεια εκτίμησης του εφικτού λόγου μη εργαζομένων-εργαζομένων στα πλαίσια πραγματικών οικονομικών συστημάτων. Τέλος, σημειώνεται ότι για την περίπτωση της συμπαραγωγής δεν θα έπρεπε να χρησιμοποιηθούν οι λεγόμενοι Συμμετρικοί Πίνακες Εισροών-Εκροών (Symmetric Input-Output Tables), τους οποίους και χρησιμοποιούμε στα πλαίσια της παρούσης εργασίας, αλλά οι λεγόμενοι Πίνακες Προσφοράς και Χρήσης (Supply and Use Tables). Για μία εμπειρική μελέτη της περίπτωσης της συμπαραγωγής, η οποία πραγματεύεται ένα διαφορετικό, από το παρόν, ζήτημα, αλλά εμπλέκει μεγέθη που εμφανίζονται και στην παρούσα εργασία (όπως η αντίστροφη μήτρα του Leontief, οι εργασιακές αξίες και το μαρξικό «ποσοστό υπεραξίας») και αναφέρεται στην ελληνική οικονομία, βλ. Σώκλης (2006), Mariolis and Soklis (2007).

Η σχέση  $C_p = c_p C_i$  δίνει την κατανάλωση των κεφαλαίουχων ανά μονάδα απασχολούμενης εργασίας, δηλ. ανά εργαζόμενο.

Η σχέση  $C_{ii} = c_{ii} C_i$  δίνει την κατανάλωση των μη εργαζομένων ανά μη εργαζόμενο.

Τη μήτρα  $A$ , το διάνυσμα των εισροών σε άμεση ομοιογενή εργασία  $\ell$  και το πραγματικό ωρομίσθιο  $C_i$  μπορούμε να τα υπολογίσουμε από τους εμπειρικούς πίνακες εισροών – εκροών. Θα αναφέρουμε στη συνέχεια της μελέτης μας τον τρόπο με τον οποίο αυτά υπολογίζονται. Έτσι, στα πλαίσια του υποδείγματός μας, τα  $A, \ell, C_i$  θεωρούνται εξωγενώς δεδομένα. Επίσης, ισχύει ακόμα ότι:

$$-1 \leq g < (1 - \lambda) / \lambda \quad (5)$$

όπου  $\lambda$  η Perron – Frobenius ιδιοτιμή της μήτρας  $A$ , η οποία είναι, ως γνωστόν, θετικός πραγματικός αριθμός (βλ. π.χ. Pasinetti, 1991, σσ. 284-94),  $(1 - \lambda) / \lambda$  ο ρυθμός μεγέθυνσης που αντιστοιχεί σε μηδενική συνολική κατανάλωση, δηλαδή ο μέγιστος ή, αλλιώς, ο *à la* von Neumann ρυθμός μεγέθυνσης του συστήματος (αναλυτικά για αυτήν την έννοια βλ. π.χ. Kurz and Salvadori, 1995, chs 4 and 13), ενώ για  $g = -1$  το διάνυσμα της εκροής του συστήματος έχει την ίδια σύνθεση με το διάνυσμα της κατανάλωσης (βλ. σχέση (1)).

Από τις σχέσεις (1),(2),(3),(4) και (5) λαμβάνουμε τα εξής:

$$X = [I - A(1 + g)]^{-1} C_i (L_i + c_p L_i + c_{ii} L_{ii})$$

ή

$$1 = \ell B(g) C_i (1 + c_p + c_{ii} L)$$

όπου  $L = L_{ii} / L_i$  ο λόγος μη εργαζομένων-εργαζομένων, και λύνοντας ως προς  $L$ , προκύπτει ότι:

$$L = \{[\ell B(g) C_i]^{-1} - 1 - c_p\} / c_{ii} \quad (6)$$

όπου  $B(g) \equiv [I - A(1 + g)]^{-1}$  και  $I$  η μοναδιαία μήτρα. Δηλαδή, από τη σχέση (6), δύναμεθα να υπολογίσουμε το ζητούμενο λόγο, εξωγενώς δεδομένων των  $g, c_p, c_{ii}$ .

Ως γνωστόν, τα στοιχεία της μήτρας  $B(g)$  αποτελούν γνησίως αύξουσες συναρτήσεις του  $g$ . Επομένως, το  $L$  αποτελεί γνησίως φθίνουσα συνάρτηση των

$g, c_p, c_{ii}$  και των  $A, \ell, C_i$  ενώ είναι θετικό για εκείνες τις τιμές των  $g, c_p$  που ικανοποιούν τη σχέση  $\ell B(g)C_i(1+c_p) < 1$ . Τέλος, για  $c_{ii} = 1$  (ίδια κατανάλωση μη εργαζομένων και εργαζομένων) και  $c_p = 0$  (οι κεφαλαιούχοι αποταμιεύουν όλο το εισόδημά τους) η τιμή του  $L$  ισούται με:

$$[\ell B(0)C_i]^{-1} - 1 \quad (7)$$

δηλαδή με το λεγόμενο «ποσοστό υπεραξίας» (Marx).

Στην παράγραφο που ακολουθεί, διευκρινίζουμε γιατί το  $L$  αποτελεί γνησίως φθίνουσα συνάρτηση των  $g, c_p, c_{ii}$  και των  $A, \ell, C_i$ , ενώ είναι θετικό για εκείνες τις τιμές των  $g, c_p$  που ικανοποιούν τη σχέση  $\ell B(g)C_i(1+c_p) < 1$ .

## 1.1 Ανάλυση του Βασικού Υποδείγματος

Η αντίστροφη σχέση μεταξύ του  $L_{ii} / L_i$  και των  $c_p, c_{ii}$  αποδεικνύεται, άμεσα, από τη σχέση (6). Επιπλέον, το ότι ο λόγος  $L_{ii} / L_i$  αποτελεί γνησίως φθίνουσα συνάρτηση των  $g, A, \ell, C_i$  αποδεικνύεται ως εξής:

Έστω τυχαία μήτρα  $M(g)$ , της οποίας τα στοιχεία είναι συνεχείς συναρτήσεις ενός βαθμωτού  $g$ . Για την πρώτη παράγωγο της αντίστροφης μήτρας  $M^{-1}(g)$  ισχύει το εξής (βλ.π.χ. Barnett, 1990, p. 84):

$$d[M^{-1}(g)]/dg = -[M^{-1}(g)]\{d[M(g)/dg\}[M^{-1}(g)]$$

Εφαρμόζοντας τον παραπάνω μαθηματικό τύπο στη μήτρα  $[I - A(1+g)]$ , λαμβάνουμε

$$d[I - A(1+g)]^{-1}/dg = -[I - A(1+g)]^{-1}(-A)[I - A(1+g)]^{-1}$$

ή

$$d[I - A(1+g)]^{-1}/dg = [I - A(1+g)]^{-1}A[I - A(1+g)]^{-1}$$

η οποία είναι θετική. Αυτό γιατί ένα από τα θεωρήματα των Perron – Frobenius (βλ. π.χ. Pasinetti, 1991, σελ. 291) διασφαλίζει ότι για  $-1 \leq g < (1-\lambda)/\lambda$ , όπου  $\lambda$  η P-F

ιδιοτιμή της μήτρας  $A$ , η μήτρα  $[I - A(1+g)]^{-1}$  είναι θετική. Επίσης, αναλόγως αποδεικνύεται ότι κάθε αύξηση των  $A, \ell, C_i$  οδηγεί σε αύξηση των στοιχείων του βαθμωτού  $\ell[I - A(1+g)]^{-1}C_i$ . Η θετικότητα του  $L$  για εκείνες τις τιμές των  $g, c_p$  που ικανοποιούν τη σχέση  $\ell B(g)C_i(1+c_p) < 1$  προκύπτει, άμεσα, από τη σχέση  $\ell B(g)C_i(1+c_p + c_i L) = 1$ .

Τέλος, σε ότι αφορά στο λεγόμενο «μαρξικό ποσοστό υπεραξίας» (αναλυτικά για ό,τι ακολουθεί, βλ. π.χ. Fujimori, 1982, ch. 1), αυτό ορίζεται, όπως είναι γνωστό, ως ο λόγος της υπεραξίας (= εργασιακή αξία καθαρού προϊόντος μείον εργασιακή αξία των συνολικών πραγματικών μισθών) προς την εργασιακή αξία των συνολικών πραγματικών μισθών, ήτοι

$$(vY - vC_i L_i) / vC_i L_i$$

όπου  $v = \ell[I - A]^{-1} (= \ell B(0))$  το διάνυσμα των εργασιακών αξιών των εμπορευμάτων (ήτοι, η ποσότητα της εργασίας που απαιτείται, άμεσα και έμμεσα, για την παραγωγή των εμπορευμάτων). Επειδή,  $Y = [I - A]X$  έπεται, άμεσα, ότι

$$vY = \ell B(0)[I - A]X = \ell X = L_i$$

και, συνεπώς, ότι το ποσοστό υπεραξίας ισούται με

$$(L_i - vC_i L_i) / vC_i L_i = (vC_i)^{-1} - 1$$

Κλείνοντας την παρούσα ανάλυση, θα πρέπει να αναφερθεί ότι αρκετά από τα προηγούμενα, ήτοι η αντίστροφη συσχέτιση του λόγου μη εργαζομένων-εργαζομένων από τα  $g, A, \ell, C_i$ , καθώς και η θετικότητα των εργασιακών αξιών και του «ποσοστού υπεραξίας», δεν είναι πάντοτε δεδομένα στα πλαίσια συστημάτων συμπαραγωγής, τόσο θεωρητικών-αφηρημένων όσο και εμπειρικά δεδομένων (λάβε υπόψη τα Steedman, 1977, chs 11-13, Steedman, 1985, Kurz and Salvadori, 1995, ch. 8, Σώκλης, 2006, Mariolis and Soklis, 2007).

## 1.2 Ανάλυση του Υποδείγματος στο πλαίσιο της Ανοικτής Οικονομίας

Προκειμένου η ανάλυση να γίνει περισσότερο *ρεαλιστική*, υποθέτουμε, για τη συνέχεια, τα εξής:

(1). Η οικονομία είναι ανοικτή και, έτσι, περιλαμβάνουμε στο υπόδειγμά μας το διάνυσμα των εξαγωγών ( $E$ ) και των εισαγωγών ( $M$ ). Το διάνυσμα  $E - M$  παριστά, λοιπόν, το διάνυσμα των *καθαρών* εξαγωγών του συστήματος.

(2). Το διάνυσμα των επενδύσεων ( $I^n$ ) είναι εξωγενώς δεδομένο και αμετάβλητο, και *δεν έχει* την ίδια σύνθεση με το διάνυσμα  $AX$ , πράγμα που συνεπάγεται ότι *δεν υφίσταται* ένας διατομεακά ενιαίος ρυθμός μεγέθυνσης.

Κατά συνέπεια, η βασική σχέση του υποδείγματος γίνεται

$$X = AX + I^n + C_i L_i + C_p L_i + C_{ii} L_{ii} + E - M$$

Έτσι, λαμβάνουμε

$$X = [I - A]^{-1} I^n + [I - A]^{-1} C_i (L_i + c_p L_i + c_{ii} L_{ii}) + [I - A]^{-1} (E - M)$$

ή

$$1 = \nu(I^n / L_i) + \nu C_i (1 + c_p + c_{ii} L) + \nu(E - M) / L_i$$

ή

$$(1 / \nu C_i) - (\nu I^n / \nu C_i L_i) - 1 - c_p - [\nu(E - M) / \nu C_i L_i] = c_{ii} L$$

και λύνοντας ως προς  $L$  προκύπτει ότι:

$$L = \{(1 / \nu C_i) - \{\nu[I^n + (E - M)] / \nu C_i L_i\} - (1 + c_p)\} / c_{ii} \quad (8)$$

από την οποία και συμπεραίνουμε ότι το  $L$  είναι θετικό όταν και μόνον όταν

$$c_p < (1 / \nu C_i) - \{\nu[I^n + (E - M)] / \nu C_i L_i\} - 1 \quad (9)$$

## **Συμπέρασμα**

Το βασικό μας υπόδειγμα δύναται να οδηγήσει σε μία εκτίμηση του εφικτού λόγου μη εργαζομένων-εργαζομένων και στην περισσότερο ρεαλιστική περίπτωση της ανοικτής και μη αναλογικά μεγεθυνόμενης οικονομίας. Στα ακόλουθα πραγματευόμαστε το ζήτημα της εφαρμογής του υποδείγματος.

## **ΚΕΦΑΛΑΙΟ 2<sup>ο</sup>: ΕΜΠΕΙΡΙΚΗ ΑΝΑΛΥΣΗ**

## Ι) ΕΜΠΕΙΡΙΚΗ ΑΝΑΛΥΣΗ

### Εισαγωγή

Σε αυτή την ενότητα, εφαρμόζουμε το θεωρητικό υπόδειγμα για να μπορέσουμε να εκτιμήσουμε τον εφικτό λόγο μη εργαζομένων-εργαζομένων. Συγκεκριμένα, βάσει των διαθέσιμων πινάκων εισροών – εκροών της ελληνικής οικονομίας, για τα έτη 1997-1998, μπορούμε να υπολογίσουμε τα εξής:<sup>2</sup>

- 1) Τη μήτρα  $A$  των τεχνικών συντελεστών, το διάνυσμα επιπέδων λειτουργίας του συστήματος  $X$ , το διάνυσμα των εισροών σε άμεση ομοιογενή εργασία  $\ell$ , το διάνυσμα του πραγματικού ωρομισθίου  $C_i$  και την εργασία  $L_i$ .
- 2) Δίνοντας παραμετρικά τιμές στα  $c_p$ ,  $c_{ii}$ ,  $g$ , που είναι θετικά βαθμωτά, μπορούμε να υπολογίσουμε, βάσει της σχέσης (6) του υποδείγματός μας, το λόγο  $L$ .
- 3) «Προσθέτοντας» στο υπόδειγμά μας τα διανύσματα των εξαγωγών ( $E$ ), των εισαγωγών ( $M$ ) και των επενδύσεων ( $I^n$ ), τα οποία και περιέχονται στους διαθέσιμους εμπειρικούς πίνακες, δυνάμεθα να υπολογίσουμε, βάσει της σχέσης (8) του υποδείγματός μας, το λόγο  $L$ .

### 1. Ανάλυση Εμπειρικών Δεδομένων

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<sup>2</sup> Οι εν λόγω πίνακες διατίθενται από τη Διεύθυνση Εθνικών Λογαριασμών της Εθνικής Στατιστικής Υπηρεσίας της Ελλάδας (Ε.Σ.Υ.Ε.).



## 1.1 Υπολογισμός του Λόγου στο πλαίσιο της Κλειστής Οικονομίας για Ενιαίο Ρυθμό Μεγέθυνσης

Καταρχάς, θα αναφέρουμε ότι τα εμπειρικά δεδομένα τα συλλέξαμε σε μορφή excel.<sup>3</sup> Οι μετρήσεις μας τις οποίες παρουσιάζουμε στο Παράρτημα ΙΙ, στο τέλος της εργασίας, έγιναν βάση του προγράμματος «Mathematica». Τα μεγέθη τα οποία απαιτείται να υπολογίσουμε είναι τα εξής:  $\{A, X, \ell, C_i, L_i, E, M, I^n\}$ .

### 1.1.1. Εξαγωγή της Μήτρας των Τεχνικών Συντελεστών

Από τους διαθέσιμους πίνακες δυνάμεθα να υπολογίσουμε τη μήτρα  $A$  των τεχνικών συντελεστών. «Οι τεχνολογικοί ή τεχνικοί συντελεστές καθορίζουν τα ποσά των εισροών που απαιτούνται από τους διάφορους παραγωγικούς τομείς της οικονομίας προκειμένου να παραχθεί ποσότητα μίας χρηματικής μονάδας από το προϊόν του υπό εξέταση παραγωγικού τομέα. Συνεπώς οι τεχνολογικοί συντελεστές αντιπροσωπεύουν τη χρησιμοποιούμενη τεχνολογία».<sup>4</sup>

Η συγκεκριμένη μήτρα  $A$  είναι διαστάσεων 58x58 καθώς τα στοιχεία που συγκεντρώσαμε από την Ε.Σ.Υ.Ε., αφορούν πίνακες εισροών – εκροών με 58 κλάδους και 58 προϊόντα. Θα αναφέρουμε ενδεικτικά ότι ένας πίνακας εισροών – εκροών είναι ένας «πίνακας διπλής εισόδου όπου ο κάθε παραγωγικός τομέας εμφανίζεται δύο φορές. Μία φορά στις γραμμές του πίνακα ως παραγωγός προϊόντων (εκροών) για την ικανοποίηση της ενδιάμεσης και της τελικής ζήτησης και μία φορά στις στήλες του πίνακα ως αγοραστής αγαθών και υπηρεσιών (εισροών) για την παραγωγή των προϊόντων του».<sup>5</sup> Μέσα σε κάθε αγκύλη της μήτρας  $A$  εμφανίζονται οι γραμμές της μήτρας: Π.χ. ο αριθμός 0,187165258 για το έτος 1997 που εμφανίζεται πρώτος αποτελεί το στοιχείο  $\alpha_{11}$  της μήτρας  $A$  και

<sup>3</sup> Βλ. Παράρτημα Ι στο τέλος της παρούσης εργασίας.

<sup>4</sup> Βλ. Λίβας, (1994, σελ.23 § 3.1). Έτσι, κατά τους υπολογισμούς μας υποθέτουμε, χωρίς βλάβη της γενικότητας, ότι η τιμή κάθε προϊόντος ισούται με 1 νομισματική μονάδα, πράγμα που σημαίνει ότι ως φυσική μονάδα μέτρησης του προϊόντος επιλέγεται εκείνη η (άγνωστη) ποσότητά του, την οποία παράγει το σύστημα (βλ. επίσης Miller and Blair, 1985, p. 356).

<sup>5</sup> Βλ. Λίβας, (1994, σελ.15 § 2.1).

υποδηλώνει την ποσότητα του προϊόντος 1 που εισέρχεται στην παραγωγή του κλάδου 1. Ο αριθμός 0,054393083 που ακολουθεί, αποτελεί το στοιχείο  $\alpha_{12}$  και υποδηλώνει την ποσότητα του προϊόντος 1 που εισέρχεται στην παραγωγή του κλάδου 2. Ουσιαστικά, κάθε στοιχείο της μήτρας  $A$  ( $\alpha_{11}, \alpha_{12}, \dots$  κ.λ.π.) είτε στη γραμμή είτε στη στήλη αυτής, υποδηλώνει έναν τεχνολογικό συντελεστή. Για αυτό το λόγο και η μήτρα  $A$  ονομάζεται μήτρα τεχνολογικών συντελεστών. Για να υπολογίσουμε κάθε τεχνολογικό συντελεστή «διαιρούμε κάθε στοιχείο του πίνακα εισροών – εκροών με το σύνολο της στήλης στην οποία το υπόψη στοιχείο καταχωρείται»,<sup>6</sup> όπου το σύνολο της στήλης απεικονίζεται από τη γραμμή 70 (output at basic prices – συνολική παραγωγή σε βασικές τιμές) του πίνακα εισροών – εκροών.<sup>7</sup> Έτσι, π.χ., ο συντελεστής  $\alpha_{11}$  προκύπτει από το λόγο  $X_{11}/X_1$  και δίνει αποτέλεσμα 0,187165258, ενώ ο συντελεστής  $\alpha_{21}$  προκύπτει από το λόγο  $X_{21}/X_1$  και δίνει αποτέλεσμα 0,000001864 κ.λ.π..

### 1.1.2 Εξαγωγή του Διάνυσματος της Άμεσης, Ομοιογενούς Εργασίας

Από τους εμπειρικούς πίνακες δυνάμεθα να υπολογίσουμε το διάνυσμα των εισροών σε άμεση, ομοιογενή εργασία  $l$ . Η εμφανιζόμενη σε αυτούς τους πίνακες αναλωνόμενη ποσότητα εργασίας είναι, βεβαίως, ετερογενής, πράγμα το οποίο υποδηλώνεται από το γεγονός ότι στη γραμμή 65 των εν λόγω πινάκων, όπου αναγράφονται οι μισθοί των εργαζομένων (compensation of employees) ενέχεται ένα μη ενιαίο ονομαστικό ωρομίσθιο.<sup>8</sup> Η μέθοδος που χρησιμοποιούμε για τη μετατροπή της εργασίας από ετερογενή σε ομοιογενή, είναι η μέθοδος που ακολουθείται από τους Okishio and Nakatani (1985, pp. 66-7), καθώς επίσης και από τον Ochoa, (1989, p. 428).<sup>9</sup>

Το διάνυσμα των μισθών μπορεί να γραφεί ως εξής:

<sup>6</sup> Βλ. Λίβας, (1994, σελ.23 § 3.1).

<sup>7</sup> Βλ. Παράρτημα Ι στο τέλος της εργασίας.

<sup>8</sup> Βλ. Παράρτημα Ι στο τέλος της εργασίας.

<sup>9</sup> Για τη θεωρητική δικαιολόγηση της μεθόδου, αλλά και τα όριά της, βλ. Sraffa (1985 [1960], § 10), Kurz and Salvadori (1995, pp. 322-5), και Mariolis (2006).

$$[w_1, w_2, \dots, w_{58}] \begin{bmatrix} L_1 & 0 & \dots & 0 \\ 0 & L_2 & \dots & 0 \\ 0 & 0 & \ddots & 0 \\ 0 & 0 & 0 & L_{58} \end{bmatrix}$$

όπου  $w_j$  το ονομαστικό ωρομίσθιο του κλάδου  $j$  και  $L_j$  ο αριθμός των εργαζομένων στον κλάδο  $j$ , ο οποίος δίνεται από τη γραμμή 75 (labour inputs – 1.000 persons) του πίνακα εισροών – εκροών.<sup>10</sup>

Περαιτέρω, το εν λόγω διάνυσμα γράφεται

$$w_1 [1, w_2 / w_1, \dots, w_{58} / w_1] \begin{bmatrix} L_1 & 0 & \dots & 0 \\ 0 & L_2 & \dots & 0 \\ 0 & 0 & \ddots & 0 \\ 0 & 0 & 0 & L_{58} \end{bmatrix} =$$

$$w_1 [L_1, (w_2 / w_1)L_2, \dots, (w_{58} / w_1)L_{58}] = w_1 [L_1, L_2^*, \dots, L_{58}^*]$$

$$\text{όπου } L_2^* = (w_2 / w_1)L_2, \dots, L_{58}^* = (w_{58} / w_1)L_{58}$$

οπότε το διάνυσμα  $\ell$  των εισροών σε άμεση ομοιογενή εργασία (ή, για την ακρίβεια, σε ομοιογενή εργασία εκείνου του είδους, το οποίο χρησιμοποιείται στον κλάδο  $I$  της οικονομίας) δίνεται από τον τύπο:

$$\ell = [L_1 / X_1, L_2^* / X_2, \dots, L_{58}^* / X_{58}] \quad (10)$$

όπου τα  $X_j$ , για  $j=1,2,\dots,58$ , δίνονται από τη γραμμή 70 (output at basic prices) του αντιστοίχου πίνακα εισροών-εκροών. Επομένως, το διάνυσμα των εισροών σε άμεση, ομοιογενή εργασία  $\ell$  είναι ένα διάνυσμα γραμμή, διαστάσεων  $1 \times 58$ .<sup>11</sup>

<sup>10</sup> Βλ. Παράρτημα Ι στο τέλος της εργασίας.

<sup>11</sup> Βλ. Παράρτημα ΙΙ στο τέλος της εργασίας.

### 1.1.3 Εξαγωγή του Διανύσματος του Πραγματικού Ωρομισθίου

Για το διαστάσεων  $58 \times 1$  διάνυσμα του πραγματικού ωρομισθίου υποθέτουμε το εξής: Η σύνθεση του πραγματικού ωρομισθίου είναι ίδια με τη σύνθεση της τελικής κατανάλωσης των νοικοκυριών, όπως αυτή δίνεται στη στήλη 62 του πίνακα εισροών – εκροών.<sup>12</sup> Υποθέτουμε, δηλαδή ότι όλα τα νοικοκυριά της χώρας χαρακτηρίζονται από μία ενιαία σύνθεση κατανάλωσης. Έτσι, και υποθέτοντας επιπλέον ότι η αποταμίευση από μισθούς είναι μηδενική, το διάνυσμα του πραγματικού ωρομισθίου  $C_i$  προσδιορίζεται από τον τύπο:

$$C_i = [w_1 / (D_1 + D_2 + \dots + D_{58})] \begin{bmatrix} D_1 \\ D_2 \\ \vdots \\ D_{58} \end{bmatrix} \quad (11)$$

όπου τα  $D_1, D_2, \dots, D_{58}$  δίνονται από τη στήλη 62 του πίνακα εισροών – εκροών και αποτελούν τις συνιστώσες της τελικής κατανάλωσης των νοικοκυριών.

Στο σημείο αυτό θα πρέπει να διευκρινισθεί το εξής: μέσω των ισχυόντων στην αγορά σχετικών ονομαστικών ωρομισθίων, συντελέστηκε μία αναγωγή της εργασίας που αναλώνεται στους διάφορους κλάδους του συστήματος σε εκείνη την εργασία που αναλώνεται στον κλάδο 1. Θα μπορούσε να είχε γίνει αναγωγή στην εργασία που αναλώνεται στον κλάδο  $k$ . Σε αυτήν την περίπτωση, το προσδιοριζόμενο διάνυσμα της άμεσης εργασίας, έστω  $l'$  αυτό, συνδέεται με αυτό της σχέσης (10) μέσω της σχέσης  $l' = (w_1 / w_k)l$ , όπου  $w_k$  το ονομαστικό ωρομισθίο στον κλάδο  $k$ , ενώ στη σχέση (11) δεν θα υπεισερχόταν το  $w_1$  αλλά το  $w_k$ . Έτσι, αποδεικνύεται ότι το γινόμενο του διανύσματος της άμεσης, ομοιογενούς εργασίας με το διάνυσμα του πραγματικού ωρομισθίου είναι *ανεξάρτητο* του τύπου της εργασίας, στον οποίο αναγόνται οι επιμέρους εργασίες του συστήματος, και, κατά συνέπεια, ότι ανεξάρτητα είναι και τα τελικά αποτελέσματα των μετρήσεών μας (βλ. σχέσεις (6) και (8)).

<sup>12</sup> Βλ. Παράρτημα Ι στο τέλος της εργασίας.

### 1.1.4 Υπολογισμός των Υπολοίπων Απαιτούμενων Μεγεθών

Οι εξαγωγές δίνονται από τη στήλη 72 (exports) του πίνακα εισροών – εκροών, οι εισαγωγές από τη γραμμή 73 (imports cif) του αντίστοιχου πίνακα, και οι επενδύσεις από τη στήλη 69 (gross capital formation) του πίνακα. Και τα τρία μεγέθη αποτελούν διανύσματα στήλης διαστάσεων 58x1. Στο παράρτημα παρουσιάζουμε το διάνυσμα των καθαρών εξαγωγών ( $E - M$ ). Επομένως, υπολογίζοντας τα  $A, \ell, C_i$  από τους διαθέσιμους πίνακες, βάσει της σχέσης (7) μπορούμε να εκτιμήσουμε το «ποσοστό υπεραξίας» που ισούται με:<sup>13</sup>

$$[\ell B(0)C_i]^{-1} - 1$$

όπου  $B(0) \equiv [I - A]^{-1}$ , η λεγόμενη «αντίστροφη μήτρα του Leontief». Κατ'αυτόν τον τρόπο, το «ποσοστό υπεραξίας» για το 1997 βρέθηκε ίσο με 2.332, ενώ για το 1998 βρέθηκε ίσο με 2.257, πράγμα το οποίο σημαίνει ότι με μηδενικό ρυθμό μέγεθυνσης, με μηδενική κατανάλωση των κεφαλαιούχων, και με κατανάλωση μη εργαζομένων ίση με αυτήν των εργαζομένων, κάθε ένας εργαζόμενος δύναται να συντηρεί περίπου 2.3 μη εργαζόμενους.

## 1.2 Υπολογισμός του Λόγου στο πλαίσιο της Κλειστής Οικονομίας για Μεταβλητό Ρυθμό Μεγέθυνσης

Καθώς υπολογίσαμε το «ποσοστό υπεραξίας», πρέπει, τώρα, να υπολογίσουμε το εύρος των οικονομικά σημαντικών τιμών του  $g$ . Από τη σχέση (5) έπεται  $-1 \leq g < (1 - \lambda) / \lambda$ , ήτοι η μέγιστη, θεωρητικά, τιμή του  $g$  δίνεται από τη σχέση  $(1 - \lambda) / \lambda$ . Μέσω του Mathematica, υπολογίζουμε όλες τις ιδιοτιμές της μήτρας  $A$  και επιλέγουμε τη μέγιστη.<sup>14</sup> Έτσι, βρίσκουμε, στρογγυλοποιώντας στα δύο δεκαδικά,  $g_{\max} = 0.6$  (1997) και  $g_{\max} = 0.49$  (1998). Επειδή όμως για αυτές τις δύο τιμές του  $g$  έχουμε αρνητικά αποτελέσματα για το  $L$ , θεωρούμε ότι για το 1997 η

<sup>13</sup> Βλ. Παράρτημα II στο τέλος της εργασίας.

<sup>14</sup> Βλ. Παράρτημα II στο τέλος της εργασίας.

μέγιστη εφικτή τιμή είναι 0.5, ενώ για το 1998 ότι είναι 0.4. Οπότε δίνουμε αυθαίρετα ένα εύρος τιμών στο  $g$  από 0 έως 0.5 (δηλαδή 0,0.1,0.2,0.3,0.4,0.5,) για το κατά σειρά πρώτο έτος, και από 0 έως 0.4 (δηλαδή 0,0.1,0.2,0.3,0.4), για το κατά σειρά δεύτερο έτος.

Στη συνέχεια από τη σχέση  $\ell B(g)C_i(1+c_p)=1$ , όπου  $B(g) \equiv [I - A(1+g)]^{-1}$  και για  $g$  από 0 έως 0.5, και από 0 έως 0.4, αντίστοιχα, βρίσκουμε το αντίστοιχο  $c_p$ . Τέλος, επιλέγουμε να δώσουμε, *συμβατικά*, τις ακόλουθες τιμές στο  $c_{ii}$ : 0.8, 0.9, 1.0. Έτσι, από τη σχέση (6), ήτοι

$$L = \{[\ell B(g)C_i]^{-1} - 1 - c_p\} / c_{ii}$$

λαμβάνουμε τις εφικτές τιμές του λόγου μη εργαζομένων-εργαζομένων.

Στο αμέσως επόμενο κεφάλαιο θα παραθέσουμε τα αποτελέσματα των μετρήσεών μας και θα τα σχολιάσουμε.

### 1.3 Υπολογισμός του Λόγου στο πλαίσιο της Ανοικτής Οικονομίας

Θεωρώντας την περίπτωση της ανοικτής οικονομίας, βρίσκουμε τις τιμές που δύναται να λαμβάνει το  $c_p$  από την εξίσωση (9) και, εν συνεχεία, υπολογίζουμε το  $L$  από την εξίσωση (8).<sup>15</sup> Τα αποτελέσματα δείχνουν ότι, όταν  $c_p = 0$ , ο λόγος μη εργαζομένων – εργαζομένων για το 1997 κυμαίνεται από 2.118 έως 2.648, ενώ για το 1998 κυμαίνεται από 2.043 έως 2.554.

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<sup>15</sup> Για το διάνυσμα  $v$  βλ. Παράρτημα II στο τέλος της εργασίας.

## II) ΑΠΟΤΕΛΕΣΜΑΤΑ ΜΕΤΡΗΣΕΩΝ

### 2. Παράθεση Πινάκων – Συνολικά Αποτελέσματα

Έτος Ελλάδα	1997		
$g$	$c_{ii} > 0$	$c_p$	$L$ : λόγος εργασίας ( $L = L_{ii} / L_i$ )
0	0.8	0	2.9153
0	0.9	0	2.59138
0	1.0	0	2.33224
0	0.8	1	1.6653
0	0.9	1	1.48027
0	1.0	1	1.33224
0	0.8	$c_{p \max} = 2$	0.415303
0	0.9	2	0.369158
0	1.0	2	0.332242
0.1	0.8	0	2.50396
0.1	0.9	0	2.22574
0.1	1.0	0	2.00317
0.1	0.8	1	1.25396
0.1	0.9	1	1.11463
0.1	1.0	1	1.00317
0.1	0.8	$c_{p \max} = 2$	0.00395667
0.1	0.9	2	0.00351704
0.1	1.0	2	0.00316533
0.2	0.8	0	2.06384
0.2	0.9	0	1.83453
0.2	1.0	0	1.65107

0.2	0.8	0.5	1.43884
0.2	0.9	0.5	1.27897
0.2	1.0	0.5	1.15107
0.2	0.8	$c_{p \max} = 1$	0.813843
0.2	0.9	1	0.723416
0.2	1.0	1	0.651074
0.3	0.8	0	1.57972
0.3	0.9	0	1.4042
0.3	1.0	0	1.26378
0.3	0.8	0.5	0.954721
0.3	0.9	0.5	0.848641
0.3	1.0	0.5	0.763776
0.3	0.8	$c_{p \max} = 1$	0.329721
0.3	0.9	1	0.293085
0.3	1.0	1	0.263776
0.4	0.8	0	1.01784
0.4	0.9	0	0.904746
0.4	1.0	0	0.814272
0.4	0.8	0.4	0.51784
0.4	0.9	0.4	0.460302
0.4	1.0	0.4	0.414272
0.4	0.8	$c_{p \max} = 0.8$	0.0178396
0.4	0.9	0.8	0.0158574
0.4	1.0	0.8	0.0142716
0.5	0.8	0	0.282179
0.5	0.9	0	0.250826
0.5	1.0	0	0.225743
0.5	0.8	0.1	0.157179
0.5	0.9	0.1	0.139714
0.5	1.0	0.1	0.125743
0.5	0.8	$c_{p \max} = 0.2$	0.0321787



0.5	0.9	0.2	0.0286033
0.5	1.0	0.2	0.025743

Ετος Ελλάδα	1998		
	$c_{ii} > 0$	$c_p$	$L$ : λόγος εργασίας ( $L = L_{ii} / L_i$ )
0	0.8	0	2.82095
0	0.9	0	2.50751
0	1.0	0	2.25676
0	0.8	1	1.57095
0	0.9	1	1.3964
0	1.0	1	1.25676
0	0.8	$c_{p \max} = 2$	0.320947
0	0.9	2	0.285286
0	1.0	2	0.256758
0.1	0.8	0	2.39991
0.1	0.9	0	2.13325
0.1	1.0	0	1.91992
0.1	0.8	0.75	1.46241
0.1	0.9	0.75	1.29992
0.1	1.0	0.75	1.16992
0.1	0.8	$c_{p \max} = 1.5$	0.524906
0.1	0.9	1.5	0.466583
0.1	1.0	1.5	0.419925
0.2	0.8	0	1.9296
0.2	0.9	0	1.7152
0.2	1.0	0	1.54368
0.2	0.8	0.5	1.3046
0.2	0.9	0.5	1.15964

0.2	1.0	0.5	1.04368
0.2	0.8	$c_{p \max} = 1$	0.054598
0.2	0.9	1	0.0485315
0.2	1.0	1	0.0436784
0.3	0.8	0	1.36289
0.3	0.9	0	1.21146
0.3	1.0	0	1.09032
0.3	0.8	0.5	0.737894
0.3	0.9	0.5	0.655906
0.3	1.0	0.5	0.590315
0.3	0.8	$c_{p \max} = 1$	0.112894
0.3	0.9	1	0.10035
0.3	1.0	1	0.0903151
0.4	0.8	0	0.542417
0.4	0.9	0	0.482148
0.4	1.0	0	0.433934
0.4	0.8	0.15	0.354917
0.4	0.9	0.15	0.315482
0.4	1.0	0.15	0.283934
0.4	0.8	$c_{p \max} = 0.3$	0.167417
0.4	0.9	0.3	0.148815
0.4	1.0	0.3	0.133934

## 2.1 Σχολιασμός Πινάκων στο πλαίσιο της Κλειστής Οικονομίας

Η πρώτη στήλη του κάθε πίνακα εμφανίζει τον εξυποθέσεως ενιαίο ρυθμό μεγέθυνσης της οικονομίας. Το  $g$  κυμαίνεται από 0 έως 0.5 στον 1<sup>ο</sup> πίνακα και από 0 έως 0.4 στον 2<sup>ο</sup> πίνακα.

Η δεύτερη στήλη του κάθε πίνακα εμφανίζει τις τιμές που δίνουμε παραμετρικά στο  $c_{ii}$ . Το  $c_{ii}$  παίρνει, συμβατικά, τιμές από 0.8 έως 1.0.

Η τρίτη στήλη του κάθε πίνακα εμφανίζει τις τιμές που δύναται να λαμβάνει το  $c_p$ . Στο σημείο αυτό να υπενθυμίσουμε ότι το  $c_p$  υπολογίζεται από την εξίσωση  $\ell B(g)C_i(1+c_p)=1$ , όπου  $B(g) \equiv [I - A(1+g)]^{-1}$ . Όλα τα μεγέθη είναι γνωστά και λύνοντας ως προς  $c_p$ , για τις διάφορες τιμές των  $g$  και  $c_{ii}$ , βρίσκουμε ένα εύρος τιμών για το  $c_p$ . Έστω π.χ. ότι στους υπολογισμούς μας βρίσκουμε  $c_p = 2.134$ , για  $g=0$  και  $c_{ii}=0.8$ . Δηλαδή η μέγιστη τιμή που μπορεί να λάβει το  $c_p$  στη συγκεκριμένη περίπτωση είναι 2.134. Στρογγυλοποιούμε λίγο προς τα κάτω αυτόν τον αριθμό και θεωρούμε ότι ισούται με 2. Στη συνέχεια υπολογίζουμε το  $L$  για  $c_{p \max}=2$ ,  $c_p=1$  όπου 1 είναι το μισό της μέγιστης τιμής του  $c_p=2$  και  $c_p=0$ . Έτσι για αυτές τις τρεις τιμές του  $c_p$ , καθώς και για  $c_{ii}=0.8, 0.9, 1.0$ , βρίσκουμε ένα εύρος τιμών για το λόγο  $L$ . Αυτή η διαδικασία ακολουθείται για όλους τους εφικτούς συνδυασμούς των  $g, c_{ii}$  και  $c_p$ .

Τέλος, στην τέταρτη στήλη του κάθε πίνακα παρουσιάζουμε το λόγο εργασίας που εκτιμούμε για καθένα από τα  $g, c_{ii}$  και  $c_p$ . Το  $L$  υπολογίζεται από την εξίσωση (6):

$$L = \{[\ell B(g)C_i]^{-1} - 1 - c_p\} / c_{ii}$$

## 2.2 Σχολιασμός των Αριθμητικών Αποτελεσμάτων

Αναφέροντας τον τρόπο που υπολογίζονται τα  $g, c_{ii}, c_p$  και  $L$ , παρατηρούμε τα εξής: Το  $L$  έχει μειωτική τάση καθώς το  $g$  αυξάνεται από 0 έως 0.5 και από 0 έως 0.4 για το 1997 και το 1998 αντίστοιχα. Άλλωστε, γνωρίζουμε *a priori*, δηλαδή από τη θεωρητική ανάλυση ότι το  $L$  αποτελεί γνησίως φθίνουσα συνάρτηση των  $g, c_{ii}, c_p$  (και  $A, \ell, C_i$ ).

Όταν  $c_p = 0$  και  $g = 0$ , ο λόγος κυμαίνεται από 2.33224 (=ποσοστό υπεραξίας) έως 2.9153, για το 1997, ενώ για το 1998 οι αντίστοιχες τιμές είναι από 2.25676 (=ποσοστό υπεραξίας) έως 2.82095. Παρατηρούμε λοιπόν ότι για το 1997 το  $L$  τείνει, γενικά, να είναι μεγαλύτερο σε σχέση με το 1998. «Κατά μέσο όρο», ο λόγος εργασίας το έτος 1997 είναι μεγαλύτερος σε σύγκριση με το 1998, εκτός από ελάχιστες περιπτώσεις. Αυτό οφείλεται, κυρίως, στις μικρότερες τιμές που λαμβάνει το  $c_{p \max}$  το 1998 συγκριτικά με το 1997. Π.χ. το 1997 για  $g=0.1, c_{ii}=0.8$  και  $c_{p \max}=2$ , το  $L=0.00395667$  ενώ για το 1998 για  $g=0.1, c_{ii}=0.8$  και  $c_{p \max}=1.5$ , το  $L=0.524906$ . Τέλος, η μικρότερη τιμή του λόγου για το 1997 ισούται με 0.025743 ενώ για το 1998 η αντίστοιχη τιμή είναι 0.133934.

### 2.3 Παράθεση Πινάκων - Σχολιασμός των Αριθμητικών Αποτελεσμάτων στο πλαίσιο της Ανοικτής Οικονομίας

Έτος 1997 - Ελλάδα		
$c_{ii} > 0$	$c_p$	$L$ : λόγος εργασίας ( $L = L_{ii} / L_i$ )
0.8	0	2.64752
0.9	0	2.35335
1.0	0	2.11801
0.8	1	1.39751
0.9	1	1.24224
1.0	1	1.11801
0.8	$c_{p \max} = 2$	0.147515
0.9	2	0.131124
1.0	2	0.118012

Έτος 1998 - Ελλάδα		
$c_{ii} > 0$	$c_p$	$L$ : λόγος εργασίας ( $L = L_{ii} / L_i$ )
0.8	0	2.55417
0.9	0	2.27037
1.0	0	2.04334
0.8	1	1.30417
0.9	1	1.15926
1.0	1	1.04334
0.8	$c_{p \max} = 2$	0.0541713
0.9	2	0.0481522
1.0	2	0.043337

Οι δύο πίνακες μας δίνουν τις τιμές που μπορεί να λάβει ο λόγος μη εργαζομένων – εργαζομένων, όταν περιλαμβάνονται στη βασική σχέση του υποδείγματός μας οι επενδύσεις, οι εξαγωγές και οι εισαγωγές. Τα αριθμητικά αποτελέσματα που παίρνουμε στην τρίτη στήλη προκύπτουν, όπως έχει ήδη αναφερθεί, από τη σχέση (8), ήτοι

$$L = \{(1/\nu C_i) - \{\nu[I^n + (E - M)]/\nu C_i L_i\} - (1 + c_p)\} / c_{ii}$$

Διαπιστώνουμε, λοιπόν, ότι για το 1997 το  $L$  είναι μεγαλύτερο, συγκριτικά με το 1998, και ότι για  $c_p = 0$  και  $c_{ii} = 1$  βρίσκεται, και για τα δύο έτη, κοντά στην τιμή 2. Τέλος, αξίζει να σημειωθεί ότι αυτές οι τιμές, ήτοι 2.11801 (1997) και 2.04334 (1998), είναι *μεγαλύτερες* από τις τιμές που λαμβάνονται, για  $c_p = 0$ ,  $c_{ii} = 1$  και  $g = 10\%$ , από το υπόδειγμα της κλειστής και αναλογικά μεγεθυνόμενης οικονομίας (βλ. Πίνακες της §2), ήτοι 2.00317 (1997) και 1.91992 (1998), πράγμα που, εάν και απαιτείται μία περισσότερο λεπτομερειακή, συγκριτική εξέταση όλων των εμπλεκόμενων μεγεθών, δύναται να λεχθεί ότι μάλλον ανάγεται στο γεγονός (βλ. σχέση (8)) ότι η εργασιακή αξία των καθαρών εξαγωγών ανά μονάδα απασχολούμενης εργασίας,  $\nu(E - M)/L_i$ , είναι και για τα δύο έτη *αρνητική*, και, συγκεκριμένα, ισούται με -0.169 (1997) και -0.178 (1998).<sup>16</sup>

## Συμπερασματικές Παρατηρήσεις

Στην παρούσα μελέτη επικεντρωθήκαμε στην ποσοτική εκτίμηση του εφικτού λόγου μη εργαζομένων – εργαζομένων για την ελληνική οικονομία των ετών 1997 και 1998. Στο πρώτο μέρος της ανάλυσής μας, παρουσιάσαμε το υπόδειγμα στο οποίο βασιστήκαμε για τον υπολογισμό αυτού του λόγου. Αρχικά, θεωρήσαμε ένα μοντέλο

<sup>16</sup> Θα πρέπει να σημειωθεί ότι σύμφωνα με την ‘Απογραφή Πληθυσμού του 2001’ (ΕΣΥΕ) ο συνολικός πληθυσμός εργάσιμης ηλικίας (ήτοι άνω των 10 ετών) είναι 9.859.593, το εργατικό δυναμικό είναι 4.615.470, οι απασχολούμενοι είναι 4.102.091, και οι οικονομικώς μη ενεργοί είναι 5.244.123 (βλ. Κρητικίδης, 2003, σελ. 38). Βάσει αυτών έπεται, λοιπόν, ότι ο λόγος μη εργαζομένων-εργαζομένων, όπως αυτός εννοείται στα πλαίσια της μελέτης μας, που αντιστοιχεί στο έτος 2001 υπερβαίνει το 1.4 (= (9.859.593-4.102.091)/4.102.291) ή εάν ληφθεί υπόψη ότι ο συνολικός πληθυσμός είναι 10.939.605, είναι περίπου ίσος με 1.7. Εάν και αυτό το αποτέλεσμα δεν είναι άμεσα συγκρίσιμο με αυτά της παρούσης μελέτης (ακόμα κι αν παραβλέψουμε το ζήτημα της αναφοράς σε διαφορετικά έτη), θα πρέπει να θεωρείται ότι μάλλον συνιστά μία όχι ασήμαντη ένδειξη της αξιοπιστίας της τελευταίας.

κλειστής οικονομίας, η οποία μεγεθύνεται με έναν διατομεακά ενιαίο ρυθμό και, εν συνεχεία, επεκτείνουμε τη διερεύνηση στην περίπτωση της ανοικτής και μη αναλογικά μεγεθυνόμενης οικονομίας.

Διαπιστώσαμε ότι το λεγόμενο «ποσοστό υπεραξίας» (το οποίο ισούται, όπως δείξαμε, με την τιμή που λαμβάνει ο λόγος μη εργαζομένων – εργαζομένων όταν (i) η οικονομία δεν μεγεθύνεται, (ii) η κατανάλωση των κεφαλαιούχων είναι μηδενική, και (iii) η κατανάλωση των μη εργαζομένων ισούται με αυτή των εργαζομένων) εμφανίζει μία σχετικά μικρή μεταβολή ανάμεσα σε αυτά τα δύο έτη: για το 1997 είναι περίπου ίσο με 2.332, ενώ για το 1998 είναι περίπου ίσο με 2.257. Επίσης, διαπιστώσαμε ότι (i) στην περίπτωση της – ιδεατά – κλειστής οικονομίας, για μηδενική κατανάλωση των κεφαλαιούχων, για κατανάλωση μη εργαζομένων ίση με αυτή των εργαζομένων και για ρυθμό μεγέθυνσης ίσο 10%, ο λόγος λαμβάνει τις τιμές 2.003 (1997) και 1.920 (1998), και (ii) στην περίπτωση της ανοικτής οικονομίας, για μηδενική κατανάλωση των κεφαλαιούχων και για κατανάλωση των μη εργαζομένων, η οποία κυμαίνεται από το 100% έως το 80% της κατανάλωσης των εργαζομένων, ο αντίστοιχος στο 1997 λόγος κυμαίνεται από 2.118 έως 2.648, ενώ ο αντίστοιχος στο 1998 λόγος κυμαίνεται από 2.043 έως 2.554. Από όλα αυτά είναι μάλλον δυνατόν να συναχθεί ότι τιμές του λόγου μη εργαζομένων – εργαζομένων, οι οποίες κυμαίνονται στην περιοχή του 1.5 με 2 (εάν όχι υψηλότερο επίπεδο) δεν θα πρέπει να θεωρούνται ως τεχνικο-κοινωνικά ανέφικτες.

Δεδομένου ότι, σε αναφορά με τον πραγματικό κόσμο, στην κατηγορία των μη εργαζομένων εμπίπτουν οι άνεργοι, οι συνταξιούχοι, τα άτομα που δεν δύνανται να εργασθούν, καθώς επίσης και κάποιο τμήμα των μαθητών, των σπουδαστών, των στρατευμένων κ.λπ., έπεται ότι η παρούσα μέτρηση συνιστά έναν πρώτο, αλλά μάλλον βασικό, προσδιορισμό των ορίων που αντικειμενικά υφίστανται για την άσκηση κοινωνικής πολιτικής, γενικά, και των ορίων του συστήματος κοινωνικής ασφάλισης, ειδικά.

Η σύνολη ανάλυση έδειξε ότι ο εφικτός λόγος μη εργαζομένων-εργαζομένων είναι μία μάλλον πολύπλοκη συνάρτηση (i) των τεχνικών δεδομένων της παραγωγής, (ii) της κατανομής του εισοδήματος μεταξύ μισθών και κερδών, (iii) της σύνθεσης και του ύψους της κατανάλωσης των διαφόρων κοινωνικών τάξεων, (iv) των τομεακών ρυθμών μεγέθυνσης, και (v) της διάρθρωσης του εξωτερικού τομέα του οικονομικού συστήματος. Επειδή για την εν λόγω συνάρτηση λίγα πράγματα δύνανται να

λεχθούν *a priori*, και επειδή ό,τι δύναται να λεχθεί *a priori* δεν ισχύει κατανάγκη και στην *ρεαλιστική* περίπτωση της συμπαραγωγής (joint production), έπεται ότι η παρούσα διερεύνηση θα πρέπει να επεκταθεί κατά τις ακόλουθες κατευθύνσεις:

(i). Προσδιορισμός και συγκριτική εξέταση των τιμών του εφικτού λόγου μη εργαζομένων-εργαζομένων για διάφορες εθνικές οικονομίες και για διάφορες χρονικές περιόδους. Σε αυτήν την ερευνητική κατεύθυνση, η οποία ήδη βρίσκεται υπό ανάπτυξη (βλ. Groza, Mariolis and Soklis, 2008), αποδεικνύεται ενδιαφέρουσα η παραβολή εθνικών οικονομιών τόσο με παρόμοια όσο και με ουσιωδώς διαφορετικά τεχνικο-κοινωνικά χαρακτηριστικά (π.χ. ελληνική «έναντι» ισπανικής, φιλανδικής και γερμανικής οικονομίας).

(ii). Μελέτη της «ευαισθησίας» των αποτελεσμάτων σε μεταβολές της σύνθεσης της κατανάλωσης των διαφόρων κοινωνικών τάξεων και της σύνθεσης των επενδύσεων.

(iii). Συγκρότηση και εφαρμογή υποδείγματος που περιλαμβάνει την τιμιακή πλευρά του συστήματος και το ‘μηχανισμό’ αποταμιεύσεων-επενδύσεων, ο οποίος συνιστά, ως γνωστόν, τον συνδετικό κρίκο ανάμεσα στην τιμιακή πλευρά και την πλευρά των φυσικών ποσοτήτων του συστήματος. Στα πλαίσια αυτής της κατεύθυνσης, αλλά και γενικά, η ύπαρξη εμπειρικών στοιχείων για το πάγιο κεφάλαιο, θα οδηγούσε, προφανώς, σε επαύξηση της αξιοπιστίας των αντλούμενων αποτελεσμάτων.

(iv). Συγκρότηση υποδείγματος συμπαραγωγής και εφαρμογή του βάσει των στοιχείων που περιέχονται στους διαθέσιμους εμπειρικούς Πίνακες Προσφοράς και Χρήσης (Supply and Use Tables).



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**ΠΑΡΑΡΤΗΜΑ Ι :**

**ΠΙΝΑΚΕΣ ΕΙΣΡΟΩΝ – ΕΚΡΟΩΝ ΓΙΑ ΤΗΝ ΕΛΛΗΝΙΚΗ  
ΟΙΚΟΝΟΜΙΑ ΤΩΝ ΕΤΩΝ 1997 - 1998**

## Παρατήρηση

Στις γραμμές του κάθε πίνακα εισροών – εκροών εμφανίζουμε τα προϊόντα της οικονομίας και στις στήλες αυτών τους αντίστοιχους κλάδους. Η συνολική παραγωγή που έχουμε στο τέλος (γραμμή 74 –supply at basic prices) ισούται με την αντίστοιχη συνολική ζήτηση (στήλη 74 – total use). Επιπλέον, δίπλα από την αύξουσα αρίθμηση των προϊόντων (κλάδων) είναι καταγεγραμμένοι οι κωδικοί που αναλογούν σε κάθε εμπόρευμα (κλάδο). Αναφερόμαστε σε 58 κλάδους με 58 προϊόντα καθώς η 6<sup>η</sup> στήλη θεωρείται μηδενική. Τέλος, θεωρούμε μια οικονομία, όπου τα μεγέθη είναι εκφρασμένα σε βασικές τιμές. (basic prices)

**ΠΙΝΑΚΑΣ Ι.1: ΠΙΝΑΚΑΣ ΕΙΣΡΟΩΝ – ΕΚΡΟΩΝ ΣΕ ΒΑΣΙΚΕΣ  
ΤΙΜΕΣ ΕΤΟΥΣ 1997**

<b>Table 17: Input-output table at basic prices</b> <b>Greece</b> <b>Mio. EUR</b> <b>current prices</b>		
<b>Year 1997</b>		
		HOMOGENEOUS UNITS OF PRODUCTION
	Code	PRODUCTS (CPA)
No		
1	01	Products of agriculture, hunting and related services
2	02	Products of forestry, logging and related services
3	05	Fish and other fishing products; services incidental of fishing
4	10	Coal and lignite; peat
5	11	Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying
6	12	Uranium and thorium ores
7	13	Metal ores
8	14	Other mining and quarrying products
9	15	Food products and beverages
10	16	Tobacco products
11	17	Textiles
12	18	Wearing apparel; furs
13	19	Leather and leather products
14	20	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials
15	21	Pulp, paper and paper products
16	22	Printed matter and recorded media
17	23	Coke, refined petroleum products and nuclear fuels
18	24	Chemicals, chemical products and man-made fibres
19	25	Rubber and plastic products
20	26	Other non-metallic mineral products
21	27	Basic metals
22	28	Fabricated metal products, except machinery and equipment
23	29	Machinery and equipment n.e.c.
24	30	Office machinery and computers

25	31	Electrical machinery and apparatus n.e.c.
26	32	Radio, television and communication equipment and apparatus
27	33	Medical, precision and optical instruments, watches and clocks
28	34	Motor vehicles, trailers and semi-trailers
29	35	Other transport equipment
30	36	Furniture; other manufactured goods n.e.c.
31	37	Secondary raw materials
32	40	Electrical energy, gas, steam and hot water
33	41	Collected and purified water, distribution services of water
34	45	Construction work
35	50	Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive f
36	51	Wholesale trade and commission trade services, except of motor vehicles and motorcycles
37	52	Retail trade services, except of motor vehicles and motorcycles; repair services of personal and hous
38	55	Hotel and restaurant services
39	60	Land transport; transport via pipeline services
40	61	Water transport services
41	62	Air transport services
42	63	Supporting and auxiliary transport services; travel agency services
43	64	Post and telecommunication services
44	65	Financial intermediation services, except insurance and pension funding services
45	66	Insurance and pension funding services, except compulsory social security services
46	67	Services auxiliary to financial intermediation
47	70	Real estate services
48	71	Renting services of machinery and equipment without operator and of personal and household goods
49	72	Computer and related services
50	73	Research and development services
51	74	Other business services
52	75	Public administration and defence services; compulsory social security services
53	80	Education services
54	85	Health and social work services
55	90	Sewage and refuse disposal services, sanitation and similar services
56	91	Membership organisation services n.e.c.
57	92	Recreational, cultural and sporting services
58	93	Other services
59	95	Private households with employed persons
60		Total
61		Direct purchases abroad by residents
62		Purchases on the domestic territory by non-residents
63		Taxes less subsidies on products
64		Total intermediate consumption/Final use at purchasers' prices
65		Compensation of employees
66		Other net taxes on production
67		Consumption of fixed capital
68		Operating surplus, net
69		Value added at basic prices
70		Output at basic prices
71		Imports cif intra EU 2)
72		Imports cif extra EU 2)
73		Imports cif
74		Supply at basic prices
75		Labour inputs (1.000 persons)

Products of agriculture, hunting and related services		Fish and other fish products; services of incidental fishing	Coal and lignite; peat	Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying	Uranium and thorium ores	Metal ores	Other mining and quarrying products	Food products and beverages
01	02	05	10	11	12	13	14	15
1	2	3	4	5	6	7	8	9
1 908	7	3			0			5 012
0	0				0		0	1
0	0	2			0			9
					0			1
					0			
					0			
					0	0		0
3	0				0		3	7
279	1	9	3	0	0	0	0	1 532
					0			
6	0	35	2	0	0	0	0	0
0	0	0	0	0	0	0	0	2
1	0				0			1
0	0	4			0	0	1	18
1	0	3	0	0	0	0	0	109
0	0		0	0	0	0	0	90
209	1	32	6	0	0	2	21	73
454	2	1	4	0	0	1	6	93
0	0	0	1	0	0	0	6	13
			0		0	0	0	1
3	0		2	0	0	0	2	25
1	5		7	0	0	0	1	164
33	4		8	0	0	1	11	4
	0				0			
0	0		13	0	0	0	5	0
0	0				0			
0	0				0			0
0	0		2	0	0	0	4	0
0	1	12			0			
0	0		0	0	0	0	0	8
					0			
74	1	0	27	0	0	2	14	81
49	0		0	0	0	0	0	5
29	1		2	0	0	0	1	2
29	0	5	3	0	0	1	6	29
95	1	4	4	0	0	0	5	252

177	2	7	7	0	0	1	9	467
0	0		0	0	0	0	0	0
21	0	4	6	0	0	0	2	1
0	0	5			0			7
0	0		1	0	0	0	0	6
0	0	18	0		0	0	0	23
0	1	2	0	0	0	0	1	27
7	2	13	9	0	0	0	1	83
4	0	1	0	0	0	0	1	15
					0			40
0	1	0	2	0	0	2	9	32
0	0		2	1	0	1	11	
0	0		2	0	0	1	3	0
0	0	1		0	0	0	4	
4	1	1	0	0	0	3	5	303
					0			
0	0			0	0	0	0	1
4	1				0			0
0	0				0			0
			0	0	0	0	0	0
0	0				0			
0	0				0			
					0			
3 393	35	162	115	5	0	18	135	8 535
					0			
					0			
- 138	2	53	5	0	0	2	17	- 524
3 255	37	214	120	5	0	20	152	8 011
490	75	96	184	9	0	41	94	1 085
- 153	0	2	1	0	0	0	1	28
552	2	38	37	4	0	5	22	250
6 048	17	151	- 6	18	0	25	71	1 137
6 938	94	287	216	31	0	72	188	2 499
10 193	132	501	336	36	0	91	341	10 510
453	8	45	4	0	0	1	18	1 998
328	39	78	47	1 931	0	3	46	367
780	47	123	51	1 932	0	4	64	2 365
10 974	178	624	387	1 968	0	95	405	12 875
650	11	27	7	0	0	2	7	144



Tobacco products	Textiles	Wearing apparel; furs	Leather and leather products	Wood and of products of wood and cork (except furniture); articles of straw and plaiting materials	Pulp, paper and paper products	Printed matter and recorded media	Coke, refined petroleum products and nuclear fuels	Chemicals and chemical products
16	17	18	19	20	21	22	23	24
10	11	12	13	14	15	16	17	18
437	377	47	0	0	2	0	0	15
	0		0	44	0	0		3
	0				0	0		0
	0	0	0	0	0	0	2	12
	0						1 975	1
	0				0		0	0
	0		0	0	0		8	22
0	0	0	21	0	2	3	1	13
6								
0	239	676	8	0	6	4	0	3
0	1	229	0	1	1	0	2	1
	0	11	139	0	0	0	0	0
0	0	0	1	121	0	0	0	1
5	5	18	2	12	166	193	1	39
1	13	45	2	1	2	10	1	39
0	12	26	2	9	15	10	103	30
3	51	48	41	18	19	55	24	556
0	29	32	29	22	23	20	6	20
	0	1	0	0	0	0	1	3
	6	0	0	1	2	7	5	2
2	3	4	2	9	9	15	1	37
	3	5	1	2	2	2	3	2
						0	0	
	1	7	0	1	1	0	7	4
						0	0	
	0				0	0	0	0
	0			0	0	0	0	0
						0		
0	1	16	0	1	1	2	2	1
	0		0	0	0	10	0	0
1	28	87	6	13	22	17	26	60
	2	9	0	0	0	2	5	2
	1	0	0	1	0	1	2	1
0	8	18	2	4	5	4	21	10
9	28	48	12	17	26	38	12	43

17	52	90	23	32	48	70	22	80
	0	0		1	0	0	3	0
	0			0	0	0	0	0
0	2	12	1	1	1	3	1	5
0	1	6	0	1	1	2	3	3
0	1	2	0	0	1	0		1
0	6	42	2	4	4	12	3	8
2	37	54	6	14	15	15	35	25
1	4	12	1	2	3	3	6	6
0	2	9	0	0	0	0	6	1
1	3	14	1	1	3	3	6	10
						0		
	0	0			0	0	0	0
						0		
12	51	265	15	11	37	46	27	157
0	1	7	0	0	0	0	1	2
						1		0
	0		0	0	0	0	2	1
	0		0	1	0	0	0	1
			0		0	10	0	
						0	0	
498	973	1 839	319	348	418	560	2 325	1 221
- 252	- 79	53	3	11	19	18	96	58
245	894	1 892	322	358	437	578	2 421	1 280
59	346	569	108	124	163	271	129	388
2	5	11	2	2	2	3	6	6
14	47	102	13	23	19	63	82	96
166	217	573	141	156	11	126	205	84
241	615	1 255	264	305	195	462	421	574
486	1 509	3 147	586	664	632	1 040	2 842	1 854
161	667	591	201	145	466	162	174	2 426
41	307	262	127	126	124	38	340	596
202	974	852	328	271	590	200	514	3 022
688	2 484	3 999	914	935	1 223	1 240	3 356	4 876
10	41	94	17	29	12	26	9	21

Rubber and plastic products	Other non-metallic mineral products	Basic metals	Fabricated metal products, except machinery and equipment	Machinery and equipment n.e.c.	Office machinery and computers	Electrical machinery and apparatus n.e.c.	Radio, television and communication equipment and apparatus
25	26	27	28	29	30	31	32
19	20	21	22	23	24	25	26
2	0	6	1	4		0	
0	0	1	0	0			
0			0	0			
0	65	11	1	0		0	0
				1			
0	4	52	2	0		0	
1	121	14	1	0	0	0	0
0	0	0	0	1			
7	0	4	3	1		0	0
0	1	1	1	2	0	0	0
0	0	0	0	0		0	0
1	6	3	4	2	0	4	0
6	10	1	3	1	0	2	0
7	4	1	2	2	0	0	1
7	64	34	8	5	0	4	1
267	15	11	18	10	0	22	1
41	11	3	15	7	2	20	2
1	185	18	4	2		3	0
9	8	560	308	76	0	138	3
6	4	192	125	12	0	9	1
2	7	20	9	106	0	2	0
0					0	0	0
3	8	3	13	96	4	66	61
			0	1	1	0	26
0	0	0	0	0	0	1	1
0	2	0	0	20		0	
0			0	0			0
1	2	0	3	1	0	0	1
0	66	72	4	90		0	0
32	99	169	23	10	0	8	1
1	1	1	0	1		0	0
2	1	0	1	0	0	0	0
10	23	6	6	4	1	2	0
16	34	43	26	28	0	14	8

30	64	79	49	52	1	26	15
0	0	0	2	0		0	
0	0		0	0			
2	2	1	2	2	0	1	1
2	2	1	1	1	0	0	1
0	0	1	0	0		0	0
7	10	3	7	5	0	3	1
22	52	35	29	18	0	21	6
3	2	2	2	1	0	1	0
2	2	6	1	0	0	0	0
3	4	3	2	1	0	1	0
0	0	0	0	0	0	0	0
40	33	39	22	23	0	11	6
0	1	0	0	0	0	0	1
0	0	0	0	0			
1	1	0	0	0			0
0	0		0	0			
533	917	1 398	699	587	9	360	139
11	71	22	10	8	0	3	2
544	988	1 420	710	595	9	363	141
169	406	259	267	287	4	93	51
3	6	6	4	3	0	2	1
29	99	39	35	26	1	11	3
70	200	103	157	48	2	50	22
271	712	408	462	364	7	156	76
815	1 700	1 828	1 172	959	16	519	217
419	315	515	352	2 064	341	366	587
135	104	751	113	513	94	129	144
554	419	1 266	465	2 577	436	495	731
1 369	2 119	3 094	1 637	3 536	452	1 014	948
17	30	15	41	29	0	7	3

Medical, precision and optical instruments, watches and clocks	Motor vehicles, trailers and semi-trailers	Other transport equipment	Furniture; other manufactured goods n.e.c.	Recovered secondary raw materials	Electrical energy, gas, steam and hot water	Collected and purified water, distribution services of water	Construction work
33	34	35	36	37	40	41	45
27	28	29	30	31	32	33	34
0		0	4	4			0
0		0	1	0			0
			0	0			0
0	0	0	0	0	281		
				0			
			0	0	0		
0	0	0	0	0	0		132
0		0	1	1	0		32
				0			
0	0	0	24	2	0	0	2
0	0	1	1	0	0	0	0
0		0	1	0	0		0
0	0	3	116	0	0		567
0	0	0	6	27	0	0	6
0	0	0	2	2	0	0	1
1	1	2	5	2	183	6	133
6	1	5	19	9	0	2	151
6	2	3	23	3	0	1	277
2	1	0	1	0	0	0	1 167
6	8	18	46	4	0	1	877
1	0	7	9	3	1	4	588
0	4	4	2	0	22	8	342
				0			0
1	1	10	1	1	14		224
1	0	0	0	0			43
26	0		0	0	0	0	1
	69	0	0	0	0	0	1
	0	43	0	0			3
1	0	1	61	0	0	0	18
0	0	0	0	2			
3	1	6	17	3	158	20	26
0	0	1	1	0	0	0	2
0	0	0	1	0	3	13	59
1	2	1	7	1	27	3	43
3	1	4	19	6	29	2	290

5	2	7	35	11	54	3	539
	0	0	0	0	0	1	9
			0	0	3		3
0	0	1	2	0			1
0	0	1	1	0	1	0	7
0			0	0	0		6
2	0	2	9	2	4	3	39
1	1	7	16	3	0	14	46
0	0	2	3	0	0		2
0	0	0	0	0			34
0	0	1	2	0	6	12	54
				0	0	11	32
0	0	0	0	0	0	0	0
				0	0		0
3	1	6	34	7	2	0	193
0	0	1	1	0	0		0
							0
0			0	0	0	0	1
0		0	0	0	1	1	1
				1	1		0
							0
71	98	137	470	99	793	106	5 952
1	8	3	9	2	187	7	1 006
72	105	140	479	101	980	113	6 958
32	34	329	279	45	694	232	1 951
0	1	2	4	1	9	1	45
5	4	17	46	11	371	20	358
4	6	69	309	46	456	12	3 794
41	44	417	639	102	1 529	266	6 148
114	150	557	1 118	203	2 509	379	13 106
379	1 343	166	363	11	0		182
209	488	236	207	70	53		263
588	1 831	402	570	81	53		445
701	1 981	959	1 688	284	2 562	379	13 551
4	3	22	46	5	34	9	255

Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	Wholesale trade and commission trade, except of motor vehicles and motorcycles	Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods	Hotels and restaurants services	Land transport; transport via pipelines services	Water transport services	Air transport services	Supporting and auxiliary transport services; travel agency services
50	51	52	55	60	61	62	63
35	36	37	38	39	40	41	42
		52	350				0
		1	4				1
		0	171				0
		2	5				
		11					
		0					
		3					
		15	1 816		25		2
		0			0		
0	14	50	22	0	0		1
1	3	5	1	0	0		0
0		2			0		0
		4	0				0
1	83	144	95	0	0	1	3
2	19	18	3	1	0	1	5
14	47	75	66	229	125	26	15
1	300	61	30	0	9		1
15	82	117	4	82			2
		2	17				
5		13					2
		9	0	0			0
9		5	8				14
		0			0		1
		11	3	24			0
		64					0
		0					2
291		2		65			0
50		0		20	25	28	4
0	2	4	12	0	0		1
		4					
14	34	54	214	14	2	2	20
1	4	7	47	1	1	0	9
0	38	54	54	0	1	2	11
222	144	114	12	226	22	4	3
3	41	54	200	25	10	2	3

6	80	107	390	47	18	4	5
	4	5	0	0	0	58	1
7	319	446	33	5		1	1
0	30	36	29		2		0
0	28	34	2	1		1	1
	95	142	32	0		204	0
8	285	434	146	23	0	4	43
1	176	181	4	1	1		4
2	9	14	4	14	9	3	6
3	10	14	19	1	0		
153	4	1 390	504	38	0	5	63
		0	3	21		33	46
		0	0			3	0
		0					1
7	198	260	114	8	0	3	31
0		1	0			0	0
		0	0				4
	56	80	0	102	4		23
	30	41	28			0	1
		0	77				0
			135	2			0
819	2 136	4 144	4 656	951	254	386	330
18	70	131	152	167	79	27	24
837	2 206	4 275	4 807	1 118	333	412	354
509	791	850	1 059	1 018	179	392	588
10	20	39	40	40	3	2	3
125	266	441	722	312	68	130	81
1 575	2 515	5 809	5 084	327	262	- 278	99
2 219	3 592	7 139	6 905	1 697	512	246	771
3 056	5 798	11 414	11 712	2 815	844	658	1 125
1			487	35	111	83	8
1			461	39	159	117	7
1			948	74	271	200	15
3 058	5 798	11 414	12 660	2 889	1 115	858	1 140
93	96	375	230	136	12	11	56



Post and telecommunications services	Financial intermediation services, except insurance and pension funding services	Insurance and pension funding services, except compulsory social security services	Services auxiliary to financial intermediation	Real estate services	Renting of machinery and equipment without operator and of personal and household goods	Computer and related services
64	65	66	67	70	71	72
43	44	45	46	47	48	49
				0		
				0		
				0		
				1	1	
				0		
0	6		0	0		
				0		
		6		0		
		20	2	32	1	4
5	23	6	1	8	11	3
24	10		15	1	3	
1	7	2	0	33		
				0	2	
				17		
				1		
			1	31		
				8		
				0		
				0		6
12				0		
4				4		
3				0		
				1		
0	10	1	0	1	14	1
74	8	4	3	17	2	4
2	9	0	0	0	0	0
17	19	6	3	743	0	
45	1		2	0	80	1
4	6	4	2	15	3	1

7	11	7	3	27	5	2
80	11	1	2	1	0	
12	16		17	1	1	
8				0		
31	5	3	0	0	0	1
1	1		0	0	1	
313	50	17	39	4	9	10
13	2 505	10	67	9	0	0
0	14	23	0	0	2	0
0	27	194	24	6	0	
43	41	18	1	27	22	16
38	48	1	1	1	1	0
3	25	2	1	0	0	
				0		
10	217	50	6	160	5	9
0	15		1	0	0	
0	15		0	2	0	
0	29		1	1	0	2
7				1	0	
				0		
3				0		
760	3 131	375	194	1 158	162	62
30	104	29	17	83	3	1
790	3 235	405	210	1 240	166	63
888	1 681	188	89	84	21	44
11	42	7	2	32	1	0
679	118	21	123	2 375	28	5
731	- 993	24	80	10 217	274	6
2 309	848	240	294	12 708	324	56
3 099	4 083	644	504	13 948	490	119
49		36		49	23	117
66		43		38	21	272
114		80		87	43	390
3 214	4 083	724	504	14 035	533	509
41	57	8	18	5	3	5

Research and development services	Other business services	Public administration and defence services; compulsory social security services	Education services	Health and social work services	Sewage and refuse disposal services, sanitation and similar services	Membership organisation services n.e.c.	Recreational, cultural and sporting services
73	74	75	80	85	90	91	92
50	51	52	53	54	55	56	57
	0	24	0	14			
	0	36	0	0			
	0	4	0	1			
	5	82	1	56		0	2
	0	43	0	18			0
	0	13	0	1	1	0	6
	0	11	0	1			1
		1					0
0	7	16	5	1		2	5
27	6	5	3	9		3	7
0	14	62	13	31	11	1	3
1	10	36	17	423	7	0	13
	1	4	0	0	1	0	0
	2	0	0	9		0	0
	0	91	0				
	0	19	0	1			
	0	707	1	16	1	1	0
		1		0			
	0	4	0	1			
	15	3	0	0			
4	3	90	6	105			0
	0	26	0	0	6		0
	0	136	0	11			
2	33	14	14	12	1	2	9
3	8	106	24	47	4	0	19
0	1	18	7	6	0	0	3
2	7	168	19	30	4	2	9
0	15	30	5	7	16	0	1
1	11	43	5	39	2	1	4

2	20	80	9	73	4	1	8
0	33	53	3	10		5	51
	8	65	8	5		0	12
	0	9	0	1			
	2	21	8	1		0	15
	0	2		0			
0	56	176	18	31		2	23
	62	169	14	20			3
	1	0	0	1		0	0
	3						
4	187	272	152	136	6	9	99
2	6	6	4	2	5	0	8
	0	15	5	31			
1	0	36	2	0			
0	90	134	33	28	0	3	8
0	18	12	6	0			
	0	171	1	19			
0	6	1	12	15		4	0
0	6		0	5		5	1
	155	17	6	0			391
	0	5	0	3			
51	795	3 035	404	1 219	70	41	703
1	56	281	48	167	12	5	21
51	851	3 317	452	1 386	82	46	724
33	836	5 915	3 724	2 256	204	184	630
0	9		5	13	1	1	32
4	159	13	136	282	33	26	101
22	1 445		415	2 125	104	63	433
58	2 449	5 928	4 280	4 676	342	273	1 196
109	3 299	9 245	4 732	6 062	423	319	1 919
51	211		125	45			31
45	303		98	34			50
96	515		222	79			81
205	3 814	9 245	4 954	6 141	423	319	2 001
3	173	262	230	170	15	21	56

Other services	Private households with employed persons	Financial intermediation services indirectly measured (FISIM)	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisations serving households (NPISH)	Final consumption expenditure by government	Final consumption expenditure
93	95						
58	59	60	61	62	63	64	65
4			8 275	1 861			1 861
			93	62			62
			187	319			319
			383				
			1 989				
			59				
			315				
1			3 908	7 221			7 221
			6	335			335
			1 174	922			922
0			280	2 535			2 535
			170	689			689
8			869	32			32
2			1 041	140			140
1			396	775			775
6			1 794	620			620
5			2 873	1 287			1 287
			930	311			311
			1 438	300			300
			2 229				
1			1 285	109			109
1			1 384	271			271
			2	2			2
			595	75			75
			165	151			151
			251	103			103
			497	532			532
			334	64			64
1			260	1 103			1 103
			250				
13			1 724	837			837
3			205	174			174
1			1 313	409			409
2			1 230	1 451			1 451
3			1 599	3 310			3 310
5			2 998	6 766			6 766
0			336	7 421			7 421

26			1 024	1 410			1 410
			169	282			282
			194	308			308
			533	149			149
9			1 910	1 085			1 085
			3 831	242			242
			180	421			421
			406	98			98
74			3 449	10 508			10 508
			286	125			125
			94				
			46			65	65
2			2 735	122			122
				198		9 047	9 245
			70	1 593		3 291	4 884
			219	3 690		2 220	5 910
			342	81			81
0			134		185		185
			661	962	100	90	1 153
			149	478			478
				266			266
170			59 271	62 206	285	14 713	77 203
8			2 228				
178			61 499	62 206	285	14 713	77 203
73	266		31 864				
1			319				
42			8 736				
332			45 157				
449	266		86 076				
627	266		147 575				
			16 387				
			10 061				
			26 448				
627	266		174 023				
43	42		3 784				

Gross fixed capital formation	Changes in valuables 1)	Changes in inventories	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	Total use
66	67	68	69	70	71	72	73	74
12		128	139	383	316	699	2 699	10 974
20			20	2	1	3	85	178
				110	8	118	437	624
		0	0	1	3	4	4	387
		- 37	- 37	6	10	16	- 21	1 968
		7	7	20	9	29	35	95
		10	10	44	35	80	90	405
		69	69	1 138	537	1 675	8 966	12 875
				124	224	348	682	688
		18	18	275	94	370	1 310	2 484
		- 28	- 28	886	326	1 212	3 719	3 999
		- 2	- 2	20	38	58	744	914
8		- 7	0	9	25	34	66	935
		- 12	- 12	12	41	53	182	1 223
4			4	26	39	65	845	1 240
		- 33	- 33	116	859	975	1 562	3 356
		290	290	158	268	426	2 003	4 876
		- 1	- 1	56	74	130	440	1 369
		12	12	117	252	369	681	2 119
		49	49	460	356	816	865	3 094
56		42	97	41	104	145	352	1 637
1 911		- 298	1 613	108	161	268	2 152	3 536
419			419	14	15	29	450	452
183		- 3	179	84	80	164	418	1 014
540		2	542	48	42	89	783	948
270		26	296	21	31	52	451	701
822		44	866	7	79	86	1 484	1 981
247		7	254	128	180	308	625	959
187		2	189	63	72	135	1 427	1 688
				24	10	34	34	284
				1	0	1	838	2 562
							174	379
11 586			11 586	127	117	244	12 238	13 551

336		0	336	10	31	41	1 827	3 058
313		- 3	310	328	250	579	4 199	5 798
581		- 5	576	610	465	1 075	8 417	11 414
				2 533	2 369	4 903	12 324	12 660
				194	260	454	1 865	2 889
				257	406	663	946	1 115
				133	222	356	664	858
				189	268	457	606	1 140
				112	107	219	1 304	3 214
				10		10	252	4 083
				108	15	122	543	724
							98	504
78			78				10 586	14 035
				59	63	122	247	533
232			232	91	91	182	414	509
				48	47	95	159	205
50			50	462	446	908	1 079	3 814
							9 245	9 245
							4 884	4 954
				6	6	12	5 922	6 141
							81	423
							185	319
98			98	38	51	89	1 340	2 001
							478	627
							266	266
17 952		276	18 229	9 815	9 505	19 320	114 752	174 023
				- 162	- 12	- 175	- 175	2 053
17 952		276	18 229	9 652	9 493	19 145	114 577	176 077



**ΠΙΝΑΚΑΣ Ι.2: ΠΙΝΑΚΑΣ ΕΙΣΡΟΩΝ – ΕΚΡΟΩΝ ΣΕ ΒΑΣΙΚΕΣ  
ΤΙΜΕΣ ΕΤΟΥΣ 1998**

Table 17: Input-output table at basic prices Greece Mio. EUR current prices Year 1998		
		HOMOGENEOUS UNITS OF PRODUCTION
	Code	PRODUCTS (CPA)
No		
1	01	Products of agriculture, hunting and related services
2	02	Products of forestry, logging and related services
3	05	Fish and other fishing products; services incidental of fishing
4	10	Coal and lignite; peat
5	11	Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying
6	12	Uranium and thorium ores
7	13	Metal ores
8	14	Other mining and quarrying products
9	15	Food products and beverages
10	16	Tobacco products
11	17	Textiles
12	18	Wearing apparel; furs
13	19	Leather and leather products
14	20	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials
15	21	Pulp, paper and paper products
16	22	Printed matter and recorded media
17	23	Coke, refined petroleum products and nuclear fuels
18	24	Chemicals, chemical products and man-made fibres
19	25	Rubber and plastic products
20	26	Other non-metallic mineral products
21	27	Basic metals
22	28	Fabricated metal products, except machinery and equipment
23	29	Machinery and equipment n.e.c.
24	30	Office machinery and computers
25	31	Electrical machinery and apparatus n.e.c.
26	32	Radio, television and communication equipment and apparatus

27	33	Medical, precision and optical instruments, watches and clocks
28	34	Motor vehicles, trailers and semi-trailers
29	35	Other transport equipment
30	36	Furniture; other manufactured goods n.e.c.
31	37	Secondary raw materials
32	40	Electrical energy, gas, steam and hot water
33	41	Collected and purified water, distribution services of water
34	45	Construction work
35	50	Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive f
36	51	Wholesale trade and commission trade services, except of motor vehicles and motorcycles
37	52	Retail trade services, except of motor vehicles and motorcycles; repair services of personal and hous
38	55	Hotel and restaurant services
39	60	Land transport; transport via pipeline services
40	61	Water transport services
41	62	Air transport services
42	63	Supporting and auxiliary transport services; travel agency services
43	64	Post and telecommunication services
44	65	Financial intermediation services, except insurance and pension funding services
45	66	Insurance and pension funding services, except compulsory social security services
46	67	Services auxiliary to financial intermediation
47	70	Real estate services
48	71	Renting services of machinery and equipment without operator and of personal and household goods
49	72	Computer and related services
50	73	Research and development services
51	74	Other business services
52	75	Public administration and defence services; compulsory social security services
53	80	Education services
54	85	Health and social work services
55	90	Sewage and refuse disposal services, sanitation and similar services
56	91	Membership organisation services n.e.c.
57	92	Recreational, cultural and sporting services
58	93	Other services
59	95	Private households with employed persons
60		Total
61		Direct purchases abroad by residents
62		Purchases on the domestic territory by non-residents
63		Taxes less subsidies on products
64		Total intermediate consumption/Final use at purchasers' prices
65		Compensation of employees
66		Other net taxes on production
67		Consumption of fixed capital
68		Operating surplus, net
69		Value added at basic prices
70		Output at basic prices
71		Imports cif intra EU 2)
72		Imports cif extra EU 2)
73		Imports cif
74		Supply at basic prices
75		Labour Inputs (1.000 persons)

Products of agriculture, hunting and related services	Products of forestry, logging and related services	Fish and other fish products; services of incidental fishing	Coal and lignite; peat	Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying	Uranium and thorium ores	Metal ores	Other mining and quarrying products	Food products and beverages
01	02	05	10	11	12	13	14	15
1	2	3	4	5	6	7	8	9
1 873	7	3			0			5 114
	0	0			0		0	1
	0	2			0			8
		0			0			1
					0			
					0			
					0	0		
4	0	0			0		4	8
325	1	9	3	0	0	0	0	1 572
					0			
7	0	34	2	0	0	0	0	0
	0	0	0	0	0	0	0	3
1	0				0			1
		4			0	0	1	19
1	0	3	0	0	0	0	0	126
0	0	0	0		0	0	0	94
166	1	24	4	0	0	1	19	62
458	2	1	2	0	0	1	5	106
	0	0	1	0	0	0	6	13
		0	0		0	0	0	1
3	0	0	1	0	0	1	2	27
1	5	0	7	0	0	1	2	179
33	0	0	7	0	0	2	13	4
					0			
	0	0	12	0	0	0	7	1
	0				0			
0	0				0			0
	0		2	0	0	0	5	0
	0	14			0			
0	0	0	0		0	0	0	9
					0			
86	0	0	31	0	0	2	14	86
51	0	0	0		0	0	0	5
34	1		2	0	0	0	1	2
36	0	5	2	0	0	1	7	33
99	1	4	3	0	0	0	5	264
184	1	8	5	0	0	1	9	491
	0		0	0	0	0	0	0

24	0	4	7	0	0	0	2	1
	0	5			0			8
	0	0	1	0	0	0	0	6
0	0	19	0		0	0	0	21
0	0	2	0	0	0	0	1	28
9	0	9	9	0	0	0	1	98
5	0	1	0	0	0	0	1	16
		0			0			69
0	0	0	2	0	0	3	10	33
0	0		2	0	0	0	11	
	0		2	0	0	1	4	0
0	0	1		0	0	0	4	
5	0	1	0	0	0	3	6	356
					0			
	0	0		0	0	0	0	1
4	0				0			0
0	0	0			0			0
0		0	0	0	0	0	0	0
	0				0			
	0				0			
					0			
3 409	22	153	108	1	0	20	145	8 866
					0			
					0			
- 257	0	49	4	0	0	2	18	- 622
3 151	22	202	112	1	0	21	163	8 243
501	58	94	196	4	0	30	102	1 136
- 158	0	2	1	0	0	0	1	35
570	3	38	38	2	0	4	25	266
6 397	10	162	- 3	8	0	20	90	1 259
7 310	70	297	233	14	0	55	218	2 697
10 462	92	499	345	15	0	76	381	10 940
510	8	56	4		0	1	18	2 285
318	36	85	43	1 600	0	4	47	366
828	44	141	46	1 600	0	5	66	2 651
11 290	136	640	391	1 616	0	81	446	13 591
676744	8397	24696	7082	407	0	2021	6945	121146

Tobacco products	Textiles	Wearing apparel; furs	Leather and leather products	Wood and of products of wood and cork (except furniture); articles of straw and plaiting materials	Pulp, paper and paper products	Printed matter and recorded media	Coke, refined petroleum products and nuclear fuels	Chemicals and chemical products
16	17	18	19	20	21	22	23	24
10	11	12	13	14	15	16	17	18
451	458	64	0	0	3	0		15
	0		0	42	0	0		4
					0	0		0
	0	0	0	0	0	0	1	12
	0						1 551	1
	0				0		0	0
	0		0	0	0		5	24
0	0	0	19	0	2	3	1	13
5								
0	265	698	8	0	6	4	0	3
0	1	207	0	1	1	0	1	1
	1	5	143	0	0	0	0	0
0	0	0	1	123	0	0	0	1
6	6	20	2	13	186	221	0	41
1	14	44	2	1	2	9	0	36
0	11	22	1	7	12	8	54	29
4	71	59	46	19	20	58	13	607
0	30	30	30	22	21	19	3	20
	0	1	0	0	0	0	1	3
	7	0	0	1	2	7	2	4
2	3	4	2	11	9	16	1	38
	4	6	1	2	3	4	2	3
						0	0	
	2	8	0	2	1	0	4	5
						0	0	
	0				0	0	0	0
	0			0	0	0	0	0
						1		
0	1	16	0	1	1	2	1	1
	0		0	0	0	9	0	0
1	31	89	6	13	22	17	17	62
	2	9	0	0	0	2	2	2
	1	0	0	1	0	1	1	1
0	9	19	2	5	5	4	14	12
4	27	46	15	17	27	40	8	41
8	51	85	28	31	50	75	16	76
	0	0		1	0	0	1	0

	0			0	0	0	0	0
0	2	14	1	1	1	3	0	6
0	1	7	0	1	1	2	1	3
0	1	2	0	0	1	0		1
0	6	40	2	4	4	11	2	8
2	47	61	6	16	15	16	19	28
1	5	13	1	3	3	3	3	6
1	4	16	0	1	1	1	5	2
1	4	14	1	1	3	4	3	10
						0		
	0	0		0	0	0	0	0
						0		
13	61	295	16	13	40	50	14	167
0	1	6	0	0	0	0	0	1
						1		0
	0		0	0	0	0	1	2
	0		0	1	0	0	0	1
			0		0	13	0	
						0	0	
500	1 127	1 899	335	358	443	607	1 750	1 288
- 259	- 99	57	3	11	19	19	61	64
241	1 029	1 956	338	369	462	626	1 811	1 352
58	375	579	109	126	159	303	138	400
2	6	13	2	3	3	4	7	7
14	53	109	14	23	21	69	65	103
165	246	665	148	161	40	141	226	103
239	680	1 365	274	312	222	518	436	614
479	1 709	3 321	612	681	684	1 144	2 247	1 966
203	689	702	223	171	569	134	196	2 765
31	326	339	120	152	136	35	265	680
235	1 015	1 041	342	323	705	169	462	3 445
714	2 723	4 362	954	1 004	1 390	1 313	2 709	5 411
9449	44747	93420	17252	29364	12236	29549	9427	23893

Rubber and plastic products	Other non-metallic mineral products	Basic metals	Fabricated metal products, except machinery and equipment	Machinery and equipment n.e.c.	Office machinery and computers	Electrical machinery and apparatus n.e.c.	Radio, television and communication equipment and apparatus	Medical, precision and optical instruments, watches and clocks
25	26	27	28	29	30	31	32	33
19	20	21	22	23	24	25	26	27
3	0	7	1	4		0		0
0	0	1	0	0				0
0			0	0				
0	59	11	1	0		0	0	0
0	3	43	2	0		0		
1	140	16	2	0		0	0	0
0	0	0	0	1				0
7	0	4	3	1		0	0	0
0	1	1	2	2		0	0	0
0	0	0	0	0		0	0	0
1	7	3	4	2	0	4	1	0
6	12	1	2	2	0	2	0	0
6	4	1	2	2	0	1	1	0
5	54	33	8	9	0	3	1	0
278	16	13	20	11	0	23	1	7
41	11	3	15	6	2	19	4	7
1	208	21	5	2		3	0	2
10	9	576	325	75	0	131	4	6
7	5	208	148	14	0	9	1	1
3	8	22	11	108	0	2	0	0
0					0	0	0	0
3	11	4	17	115	3	71	96	1
0		0	0	1	0	1	59	1
0	0	0	0	0	0	1	1	28
0	2	0	17	6		0		
0			1	0			0	
1	2	0	3	1	0	0	2	1
0	60	75	4	86		0	0	0
34	105	180	26	8	0	9	2	3
1	1	1	0	1		0	0	0
2	1	0	1	0	0	0	0	0
11	26	7	8	5	1	2	1	1
16	39	43	26	21	0	12	6	3
29	73	80	47	38	0	22	10	5
0	0	0	2	0		0	0	

0	0		0	0				
2	3	1	2	2	0	1	1	0
2	2	1	1	1	0	0	1	0
0	0	0	0	0		0	0	0
7	10	3	8	4	0	3	2	2
26	63	43	36	20	0	24	12	1
3	2	2	2	1	0	1	1	0
4	4	10	2	1	0	1	0	0
3	4	3	2	1	0	1	1	0
							0	
0	0	0	0	0		0	0	0
							0	
46	39	45	25	26	0	12	11	4
0	1	0	0	0	0	0	2	0
0	0	0	0	0			0	0
1	1	0	1	0		0	0	0
0	0			0				
562	989	1 462	780	577	7	359	221	77
12	73	23	14	12	0	4	3	1
574	1 062	1 486	794	589	7	363	224	78
177	453	266	300	302	3	103	61	36
3	7	7	5	4	0	2	1	0
31	112	42	39	27	1	12	4	5
69	273	133	196	76	3	52	64	3
280	845	448	540	409	7	168	129	44
854	1 906	1 933	1 334	998	14	532	353	123
468	359	596	405	2 280	462	519	869	453
147	118	687	117	638	92	139	173	221
615	477	1 283	522	2 918	554	659	1 042	674
1 468	2 383	3 217	1 857	3 916	568	1 190	1 395	797
16939	32692	15441	43804	30247	301	7506	2861	5098



Motor vehicles, trailers and semi-trailers	Other transport equipment	Furniture; other manufactured goods n.e.c.	Recovered secondary raw materials	Electrical energy, gas, steam and hot water	Collected and purified water, distribution services of water	Construction work	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	Wholesale trade and commission trade, except of motor vehicles and motorcycles
34	35	36	37	40	41	45	50	51
28	29	30	31	32	33	34	35	36
	0	5	4			0		
		1	0			0		
			0			0		
0	0	0	0	295				
			0	37				
		0	0	0				
0	0	0	0	0		152		
		0	1	0		31		
			0					
0	0	25	1	0	0	2	0	15
0	1	1	0	0	0	0	1	4
	0	1	0	0		0	0	
0	3	124	0	0		594		
0	0	6	26	0	0	7	1	98
0	0	2	1	0	0	1	3	20
1	2	5	1	133	5	127	13	39
1	7	20	8	1	3	162	2	350
3	4	23	3	0	2	297	18	82
2	0	1	0	0	0	1 337		
12	21	51	4	0	1	939	6	
1	9	11	3	1	5	681		
5	5	3	0	25	8	373	11	
			0			0		
1	14	1	1	18		244		
0		0	0			72		
0		0	0	0	0	2		
77		0	0	0	0	1	337	
0	45	0	0			3	54	
1	2	63	0	0	0	19	1	2
0	0	0	1			0		
2	7	17	3	225	22	35	18	39
0	1	1	0	0	0	2	1	4
0	0	1	0	4	15	72	1	42
3	1	8	1	29	4	52	224	159
1	3	17	5	39	2	297	4	42
3	6	32	10	73	3	552	7	81
0	0	0	0	0	1	15		4

		0	0	3		4	9	348
0	2	2	0			2	0	34
0	1	1	0	1	0	11	0	31
		0	0	0		8		92
1	2	9	1	5	3	68	9	294
2	10	20	3	0	18	18	1	201
0	2	3	0	0		2	3	10
0	0	1	0			76	5	18
0	1	2	0	8	13	62	183	5
			0	1	12	39		
0	0	0	0	1	0	1		
			0	0		0		
2	7	40	7	5	0	225	9	231
0	1	1	0	0		0	0	
						0		
		0	0	0	0	0		60
	0	0	0	1	1	2		32
			1	2		0		
						1		
120	158	496	92	908	118	6 586	922	2 335
10	3	12	2	163	7	1 161	22	77
131	161	507	93	1 070	125	7 747	944	2 412
35	327	298	42	800	247	2 343	610	964
1	2	5	1	10	2	54	12	23
5	20	50	11	417	12	447	132	278
20	111	327	58	543	7	4 458	1 530	2 377
61	460	680	112	1 770	268	7 302	2 284	3 642
191	621	1 187	206	2 840	394	15 048	3 228	6 055
1 602	359	422	16	0		186	1	
597	667	206	47	51		268	1	
2 199	1 026	628	63	51		454	1	
2 390	1 647	1 814	268	2 891	394	15 502	3 229	6 055
4188	22657	48233	1131	33492	9201	275229	104230	107538

Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods	Hotels and restaurants services	Land transport; transport via pipelines services	Water transport services	Air transport services	Supporting and auxiliary transport services; travel agency services	Post and telecommunications services	Financial intermediation services, except insurance and pension funding services	Insurance and pension funding services, except compulsory social security services
52	55	60	61	62	63	64	65	66
37	38	39	40	41	42	43	44	45
58	365		0		0			
1	4		0		1			
0	175		0		0			
1	5							
11								
0								
3		0						
16	1 940	0	29		1			
0			0					
53	23	0	0		1			
5	2	0	0		0	0	8	
1	0		0		0			
4	0	0			0			6
159	112	1	0	1	3			23
18	3	1	0	1	5	5	26	6
63	58	213	107	23	12	24	12	
70	37	0	10		1	1	6	4
118	4	88	0		2			
2	19	0						
14		0	0		2			
10	0	0	0		0			
5	9	0	1		15			
0			0		0			
15	4	32	0		0			
96			0		0	21		
0			0		1	5		
4		69	0		0	4		
0		21	30	28	4			
4	13	0	0		1	0	11	1
4								
61	232	5	3	2	21	92	14	5
7	50	1	1	0	9	2	15	0
60	60	0	1	3	11	22	21	7
127	15	258	30	5	4	56	3	
51	226	29	13	3	3	4	7	4
101	441	54	24	5	5	7	14	8
5	0	0	0	62	1	93	12	1

487	35	5	0	1	1	13	18	
40	35		2		0	10		
37	2	1	0	1	1	38	6	3
137	33	0	0	235	0	1	2	
448	149	24	0	4	44	372	60	19
198	2	1	1		2	15	3 148	11
16	5	16	11	3	6	0	13	27
27	35	2	1			0	66	222
1 456	543	42	1	6	66	51	47	20
0	3	22	0	35	48	45	51	1
0	0	0	0	4	0	4	21	4
0		0	0		1			
303	133	10	1	3	36	12	235	61
1	0	0	0	0	0	0	19	
0	0		0		4	0	13	
85	0	114	5		25	0	24	
43	30	0		0	1	9		
0	91		0		0			
	151	2	0		0	4		
4 430	5 044	1 014	270	425	340	911	3 870	433
146	168	196	85	28	25	35	118	34
4 576	5 212	1 210	355	453	365	946	3 988	467
953	1 173	1 090	220	347	636	953	1 804	217
47	47	45	3	3	4	12	50	9
462	779	347	83	147	89	745	137	24
5 925	5 440	425	378	- 207	109	741	- 1 236	7
7 387	7 439	1 907	684	290	838	2 451	754	256
11 963	12 651	3 117	1 039	744	1 203	3 397	4 742	723
	661	40	122	91	10	51		37
	506	38	174	134	7	66		44
	1 167	78	296	225	17	117		81
11 963	13 818	3 195	1 335	968	1 220	3 514	4 742	805
371460	238651	141619	13578	10070	53811	47621	61101	8010

Services auxiliary to financial intermediation	Real estate services	Renting of machinery and equipment without operator and of personal and household goods	Computer and related services	Research and development services	Other business services	Public administration and defence services; compulsory social security services	Education services	Health and social work services
67	70	71	72	73	74	75	80	85
46	47	48	49	50	51	52	53	54
	0	0			0	24	0	15
	0	0			0	34	0	0
	0				0	4	0	1
		0						
		0						
	1	1			7	83	1	62
	0	0			0	45		20
0	0	0			0	13	0	1
	0				0	12	0	1
	0	0			0	1		
4	34	1	4	0	8	16	7	1
0	9	10	4	32	8	5	4	9
21	1	3		0	13	52	13	29
0	34	0		1	11	35	22	468
	0	2			2	4	0	0
	22	0			2	0		9
	1	0			1	103		
2	43	0			0	22		1
	10	0			9	941	1	15
	0				0	1		0
	0	0	9		0	5	0	1
	0				22	4	0	0
	4	0		5	5	97	9	120
	0	0			0	28		0
	2	0			2	155	0	11
0	1	16	1	3	37	14	16	13
5	17	2	4	3	10	107	30	54
0	0	0	0	0	1	15	8	5
6	849	0		3	10	188	23	37
5	0	89	2	0	18	34	6	9
3	11	3	1	1	10	43	6	39
6	20	5	1	3	19	81	11	72
2	1	0		0	36	58	4	11

24	1	0			9	68	12	6
	0				0	10	1	1
0	0	0	1		3	22	11	1
0	0	1			0	3	1	0
64	4	14	7	0	63	183	21	34
47	6	0	0		72	78	11	16
0	0	3	0		1	0	0	1
65	11	0			7			
1	28	32	9	5	210	279	166	145
1	2	1	0	2	6	6	5	2
0	0	0			0	22	8	39
	0	0		1	0	40	3	0
3	179	10	7	0	115	150	40	35
0	0	0		0	20	9	7	0
0	2	0			2	190	1	22
0	1	0	2	1	7	2	16	20
	1	0		1	7		0	5
	2				169	18	8	0
	0				0	5	0	4
260	1 301	194	52	62	926	3 311	471	1 336
25	91	5	1	1	67	305	59	183
285	1 392	199	53	62	993	3 616	530	1 520
80	92	33	45	40	1 092	6 383	4 082	2 605
2	41	1	0	0	11		6	15
231	2 544	30	3	5	178	14	140	312
228	10 868	270	25	38	1 585		373	2 316
541	13 545	335	73	83	2 866	6 396	4 601	5 247
826	14 937	533	126	146	3 860	10 013	5 131	6 767
	59	28	153	52	215		151	54
	43	22	353	46	310		111	40
	102	50	506	98	525		262	93
826	15 039	583	632	243	4 385	10 013	5 393	6 860
18200	2318	4800	5710	4054	199129	270897	237065	182765

Sewage and refuse disposal services, sanitation and similar services	Membership organisation services n.e.c.	Recreational, cultural and sporting services	Other services	Private households with employed persons	Financial intermediation services indirectly measured (FISIM)	Total	Final consumption expenditure by households
90	91	92	93	95			
55	56	57	58	59	60	61	62
			4			8 482	1 925
						90	61
						190	322
						388	
						1 601	
						49	
						358	
	0	2	1			4 129	7 639
						5	391
		0				1 230	1 037
1	0	7	0			265	2 853
		1				169	731
		0	8			910	32
	2	6	3			1 175	159
	3	7	1			406	829
12	0	3	5			1 523	556
8	0	15	7			3 124	1 424
1	0	0				957	337
	0	0				1 645	330
						2 349	
				1		1 463	121
1	1	0	2			1 680	312
						2	2
						709	105
						277	215
		0				281	112
6		0				561	616
						372	74
1	2	9	1			275	1 176
						241	
3	0	22	14			1 919	970
0	0	3	3			213	181
5	2	10	1			1 503	443
18	0	1	2			1 375	1 570
2	1	5	3			1 648	3 471
4	1	9	6			3 090	7 134
	6	54	0			372	8 059

	0	12	22			1 117	1 544
						193	333
	0	17				220	347
						560	161
	2	27	10			2 091	1 188
		5				4 448	283
	0	0				197	493
						655	172
7	9	111	79			3 690	11 269
5	0	9				309	136
						112	
						51	
1	4	10	2			3 123	142
							267
						73	1 663
						240	4 021
	5	0				372	89
	5	1	0			145	
		440				746	1 048
						167	534
							309
74	45	787	176			63 533	67 188
14	5	23	9			2 291	8 371
88	50	810	185			65 824	75 558
227	227	738	80	309		35 163	
2	1	41	2			410	
35	27	127	47			9 567	
108	37	407	387			48 360	
372	292	1 313	516	309		93 500	
461	343	2 124	701	309		159 324	
		37				19 292	
		56				10 703	
		93				29 995	
461	343	2 217	701	309		189 319	
15164	24092	62370	43992	46350			



Final consumption expenditure by non-profit organisations serving households (NPISH)	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in valuables 1)	Changes in inventories	Gross capital formation	Exports intra EU fob
63	64	65	66	67	68	69	70
		1 925	26		153	179	430
		61	18		- 37	- 19	2
		322			- 22	- 22	142
					- 2	- 2	4
					15	15	
					0	0	18
					2	2	52
		7 639			123	123	1 167
		391			- 94	- 94	129
		1 037			1	1	330
		2 853			35	35	879
		731			1	1	19
		32	9		20	29	9
		159			8	8	10
		829	6		0	6	29
		556			- 176	- 176	86
		1 424			348	348	224
		337			15	15	72
		330			64	64	126
					37	37	481
		121	70		32	101	58
		312	2 182		- 568	1 615	130
		2	527		0	527	17
		105	215		- 4	211	80
		215	766		21	787	49
		112	327		27	354	20
		616	1 009		108	1 117	8
		74	592		90	682	206
		1 176	194		17	211	70
					0	0	22
		970					1
		181					
		443	13 267			13 267	150
		1 570	234		- 1	233	13
		3 471	334		5	339	347
		7 134	621		9	630	645
		8 059					2 785

		1 544					226
		333					315
		347					151
		161					207
		1 188					120
		283					11
		493					101
		172					
		11 269	79			79	
		136					67
			301			301	112
	80	80					56
		142	40			40	547
	9 746	10 013					
	3 657	5 320					
	2 586	6 606					7
		89					
198		198					
106	92	1 246	114			114	48
		534					
		309					
304	16 161	83 652	20 932		226	21 158	10 779
		8 371	1 416		8	1 425	- 123
304	16 161	92 023	22 348		234	22 582	10 656

Exports extra EU fob	Exports	Final uses	Total use
71	72	73	74
274	705	2 808	11 290
3	5	46	136
8	150	450	640
1	5	3	391
		15	1 616
14	32	31	81
34	86	88	446
534	1 701	9 463	13 591
283	412	709	714
125	455	1 494	2 723
331	1 210	4 098	4 362
35	54	786	954
23	32	94	1 004
37	47	214	1 390
44	73	907	1 313
720	806	1 186	2 709
292	515	2 287	5 411
88	160	512	1 468
218	344	738	2 383
349	830	867	3 217
113	171	394	1 857
180	309	2 236	3 916
19	36	566	568
85	165	482	1 190
67	116	1 118	1 395
30	50	516	797
87	95	1 829	2 390
313	519	1 275	1 647
82	152	1 539	1 814
6	28	28	268
0	2	972	2 891
		181	394
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463	1 108	8 872	11 963
2 601	5 387	13 446	13 818

307	533	2 078	3 195
493	808	1 141	1 335
251	402	749	968
293	500	661	1 220
115	235	1 423	3 514
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14	115	608	805
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		11 349	15 039
72	138	274	583
107	219	520	632
56	112	192	243
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7	14	6 620	6 860
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		534	701
		309	309
10 197	20 976	125 786	189 319
132	9	9 804	12 095
10 329	20 985	135 590	201 414

**ΠΑΡΑΡΤΗΜΑ ΙΙ :**  
**ΑΡΙΘΜΗΤΙΚΑ ΑΠΟΤΕΛΕΣΜΑΤΑ**

## Π.1: Μήτρα Τεχνολογικών Συντελεστών έτους 1997

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0.0195734+0.0290596 <sup>TM</sup>, -0.0195734-0.0290596 <sup>TM</sup>, 0.0274036 +0.0179333  
<sup>TM</sup>, 0.0274036 -0.0179333 <sup>TM</sup>, -0.0188838, -0.0136449+0.0119683 <sup>TM</sup>, -0.0136449-  
0.0119683 <sup>TM</sup>, 0.00538571 +0.0158203 <sup>TM</sup>, 0.00538571 -0.0158203  
<sup>TM</sup>, 0.0153353, 0.0122042, 0.00369551 +0.00614192 <sup>TM</sup>, 0.00369551 -0.00614192  
<sup>TM</sup>, 0.00574413, -0.00508754+0.00147553 <sup>TM</sup>, -0.00508754-0.00147553  
<sup>TM</sup>, 0.00161841, 0.00080647 +0.000921712 <sup>TM</sup>, 0.00080647 -0.000921712  
<sup>TM</sup>, 0.00013706, 0., 0.}

$$g_{\max} = 1 - 0.6220743741812578 = 0.377926$$

$$0.37792562581874223 / 0.6220743741812578 = 0.607525 \cong 0.6$$

#### II.4: Ιδιοτιμές Μήτρας Τεχνολογικών Συντελεστών έτους 1998

{0.670399, 0.469463, 0.384619, 0.361732, 0.264598, 0.238333, 0.233659, 0.220192  
+0.00242953 <sup>TM</sup>, 0.220192 -0.00242953 <sup>TM</sup>, 0.188608, 0.165559 +0.0190724  
<sup>TM</sup>, 0.165559 -0.0190724 <sup>TM</sup>, 0.15792, 0.115474 +0.0607004 <sup>TM</sup>, 0.115474 -0.0607004  
<sup>TM</sup>, 0.116348 +0.0126592 <sup>TM</sup>, 0.116348 -0.0126592 <sup>TM</sup>, 0.0905398, 0.06144 +0.0459073  
<sup>TM</sup>, 0.06144 -0.0459073 <sup>TM</sup>, 0.0408501 +0.0636441 <sup>TM</sup>, 0.0408501 -0.0636441  
<sup>TM</sup>, 0.0673968 +0.01477 <sup>TM</sup>, 0.0673968 -0.01477 <sup>TM</sup>, 0.0643322, -0.0630498, -  
0.0407283+0.0460624 <sup>TM</sup>, -0.0407283-0.0460624 <sup>TM</sup>, 0.0392495 +0.0400758  
<sup>TM</sup>, 0.0392495 -0.0400758 <sup>TM</sup>, 0.00466131 +0.0466795 <sup>TM</sup>, 0.00466131 -0.0466795  
<sup>TM</sup>, 0.0410221 +0.0170575 <sup>TM</sup>, 0.0410221 -0.0170575 <sup>TM</sup>, -0.0379951+0.0122896 <sup>TM</sup>, -  
0.0379951-0.0122896 <sup>TM</sup>, -0.0191691+0.0301511 <sup>TM</sup>, -0.0191691-0.0301511  
<sup>TM</sup>, 0.0265949 +0.0110966 <sup>TM</sup>, 0.0265949 -0.0110966 <sup>TM</sup>, 0.0202146, -0.0160492, -  
0.0105407+0.0110248 <sup>TM</sup>, -0.0105407-0.0110248 <sup>TM</sup>, 0.00152909 +0.0129378  
<sup>TM</sup>, 0.00152909 -0.0129378 <sup>TM</sup>, 0.0100555, 0.00652464, 0.00406416 +0.0042122  
<sup>TM</sup>, 0.00406416 -0.0042122 <sup>TM</sup>, -0.00474803+0.00178095 <sup>TM</sup>, -0.00474803-0.00178095  
<sup>TM</sup>, 0.000114388 +0.00252859 <sup>TM</sup>, 0.000114388 -0.00252859  
<sup>TM</sup>, 0.00168414, 0.0000722922, 0., 0.}

$$g_{\max} = 1 - 0.6703993952577821 = 0.329601$$

$$0.32960060474221786 / 0.6703993952577821 = 0.491648 \cong 0.4$$

#### II.5: Διάνυσμα Άμεσης Ομοιογενούς Εργασίας έτους 1997

{0.063774359, 0.759020056, 0.253846389, 0.725240183, 0.315385831, 0.595583516, 0.  
.365679033, 0.136825329, 0.159850123, 0.30399377, 0.239719899, 0.24449857, 0.2479  
90884, 0.342748104, 0.345017358, 0.060030601, 0.277215653, 0.274893321, 0.3167320  
83, 0.18821251, 0.301667314, 0.396526574, 0.356056802, 0.238111913, 0.310483219, 0.  
372110949, 0.30262995, 0.782678511, 0.33136026, 0.291363012, 0.36652324, 0.812541  
124, 0.197405743, 0.220963861, 0.180902111, 0.098728015, 0.119887209, 0.479428917  
, 0.281247986, 0.788958668, 0.693033409, 0.38009733, 0.545870328, 0.38604472, 0.234  
367113, 0.007998489, 0.05578246, 0.493473178, 0.394280418, 0.336032973, 0.8483209

88,1.043530738,0.493471322,0.63951208,0.762994242,0.435189444,0.155078481,1.325942816}}

## Π.6: Διάνυσμα Άμεσης Ομοιογενούς Εργασίας έτους 1998

{{64.68822342 ,849.2640529, 255.6257257, 768.9601666, 372.057795 ,  
532.8360291 ,360.8569091 ,140.2666358, 162.6685876, 296.4985511 ,235.4775902  
,240.9369534, 248.9045508 ,313.3391188 ,358.0287499, 82.74728429 ,274.8936942  
,280.5115426, 320.9146145, 185.8267973, 303.9306912, 408.1889168, 251.0026842  
,261.1169751 ,231.2906881, 398.0295535 ,247.2760471 ,710.1248283, 339.5295021  
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,480.9875681 ,368.1740521 ,382.1683894 ,860.7720989 ,1074.262052, 519.8302899,  
665.9618123, 895.3714749, 469.3769574, 154.1794935, 1350.293206}}

## ΠΙΝΑΚΑΣ Π.7: Διανύσματα Απαιτούμενων στον Υπολογισμό Μεγεθών

$C_{i1997}$ Πραγματικό Ωρομισθίο	Έτη - 1997, 1998				
	$C_{i1998}$	$X_{1997}$ Συνολική Παραγωγή	$X_{1998}$	$I^n_{1997}$ Επενδύσεις	$I^n_{1998}$
{{0.022562433}, {0.000756646}, {0.003867796}, {0}, {0}, {0}, {0}, {0}, {0.087551936}, {0.004056506}, {0.011176914}, {0.030738076}, {0.008347889}, {0.000386937}, {0.001700244}, {0.009395439}, {0.007518693}, {0.015606414}, {0.003770658}, {0.003634179}, {0}, {0.001325116}, {0.003286693},	{{0.0000212169}, {0.000000668762}, {0.00000354958}, {0}, {0}, {0}, {0}, {0}, {0.0000842003}, {0.00000430975}, {0.0000114346}, {0.0000314431}, {0.00000805776}, {0.00000035366}, {0.00000175728}, {0.00000913789}, {0.00000612994}, {0.0000156935}, {0.00000371504}, {0.00000363459}, {0}, {0.00000133617}, {0.00000343856},	{{10193}, {132}, {501}, {336}, {36}, {91}, {341}, {10510}, {486}, {1509}, {3147}, {586}, {664}, {632}, {1040}, {2842}, {1854}, {815}, {1700}, {1828}, {1172}, {959},	{{10462}, {92}, {499}, {345}, {15}, {76}, {381}, {10940}, {479}, {1709}, {3321}, {612}, {681}, {684}, {1144}, {2247}, {1966}, {854}, {1906}, {1933}, {1334}, {998},	{{139}, {20}, {0}, {0}, {-37}, {7}, {10}, {69}, {0}, {18}, {-28}, {-2}, {0}, {-12}, {4}, {-33}, {290}, {-1}, {12}, {49}, {97}, {1613},	{{179}, {-19}, {-22}, {-2}, {15}, {0}, {2}, {123}, {-94}, {1}, {35}, {1}, {29}, {8}, {6}, {-176}, {348}, {15}, {64}, {37}, {101}, {1615},



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## Π.8: Διάλυση Καθαρών Εξαγωγών

### 1997

{{-81,-44,-5,-47,-1916,25,16,-690,146,-604,360,-270,-237,-537,-135,461,-2596,-424,-50,-450,-320,-2309,-407,-331,-642,-536,-1745,-94,-435,-47,-52,0,-201,40,579,1075,3955,380,392,156,442,105,10,42,0,-87,79,-208,-1,393,0,-222,-67,0,0,8,0,0}}

### 1998

{{-123,-39,9,-41,-1600,27,20,-950,177,-560,169,-288,-291,-658,-96,344,-2930,-455,-133,-453,-351,-2609,-518,-494,-926,-624,-2104,-507,-476,-35,-49,0,-165,50,597,1108,4220,455,512,177,483,118,11,34,0,-102,88,-287,14,555,0,-262,-79,0,0,19,0,0}}

## Π.9: Αντίστροφη Μήτρα Leontief έτους 1997

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**Π.11: Αποτελέσματα για το Ποσοστό Υπεραξίας**

**1997**  
2.332242242256011

**1998**  
2.256757814054615

**Π.12: Αποτελέσματα για το Λόγο Μη Εργαζομένων-Εργαζομένων**

Για  $g=0$ ,  $c_{ii}=0.8,0.9,1.0$  και  $c_{pmax}=2.332242242256011$

**1997**  
2.332242242256011/0.8,  $c_p=0$   
2.9153  
2.332242242256011/0.9  
2.59138  
2.332242242256011/1.0  
2.33224  
2.332242242256011-1,  $c_p=1$   
1.33224



1.3322422422560112`/0.8  
 1.6653  
 1.3322422422560112`/0.9  
 1.48027  
 1.3322422422560112`/1.0  
 1.33224  
 2.332242242256011-2,  $c_p = 2$   
 0.332242  
 0.3322422422560112`/0.8  
 0.415303  
 0.3322422422560112`/0.9  
 0.369158  
 0.3322422422560112`/1.0  
 0.332242

Για  $g=0$ ,  $c_{ii}=0.8, 0.9, 1.0$  και  $c_{pmax}=2.256757814054615$

### 1998

2.256757814054615/0.8,  $c_p = 0$   
 2.82095  
 2.256757814054615/0.9  
 2.50751  
 2.256757814054615/1.0  
 2.25676  
 2.256757814054615-1,  $c_p = 1$   
 1.25676  
 1.2567578140546152`/0.8  
 1.57095  
 1.2567578140546152`/0.9  
 1.3964  
 1.2567578140546152`/1.0  
 1.25676  
 2.256757814054615-2,  $c_p = 2$   
 0.256758  
 0.2567578140546152`/0.8  
 0.320947  
 0.2567578140546152`/0.9  
 0.285286  
 0.2567578140546152`/1.0  
 0.256758

Η ίδια διαδικασία ακολουθείται και για τους υπόλοιπους συνδυασμούς των  $g, c_p$  και  $c_{ii}$  για τις δύο χρονιές.

## Π.13: Αποτελέσματα για το Διάνυσμα των Εργασιακών Αξιών

1997

{{0.1709744648121107`,0.9053583224408999`,0.45907968226962886`,  
0.9492351192179419`,0.3936661292574549`,0.6935625116804387`,  
0.564166934544407`,0.3725802104107638`,0.37346161302135644`,  
0.5902232945912756`,0.5731871326132193`,0.5494820055492743`,  
0.58362370570521`,0.7615183724179784`,0.6813831017361834`,  
0.40752998558316994`,0.6784035251388426`,0.6979568340356953`,  
0.6602870239143237`,0.6770160610295064`,0.696102683641714`,  
0.7947755116672603`,0.7084977932044715`,0.7118468262120625`,  
0.7457724870892197`,0.7845210206327508`,0.7904168109341515`,  
0.9732945026237312`,0.5811802272884594`,0.5855998621527636`,  
0.5679684765198593`,0.9808947536179534`,0.4706123440012293`,  
0.3604589928739896`,0.4262123217412725`,0.25972403961055546`,  
0.26593872468710605`,0.6441931252925673`,0.4244937567352867`,  
1.1594962524833536`,0.8214599213779757`,0.4991056168814853`,  
1.6072761512948892`,0.7212912059182881`,0.5793265660751429`,  
0.048968431655260464`,0.18470107355386967`,0.7182059076135415`,  
0.6623997835132528`,0.4601943421941662`,1.0583049397094653`,  
1.0791814670309612`,0.6041844270035606`,0.7102491866428606`,  
0.8214921178211216`,0.6240299986310521`,0.2456337430672994`,  
1.325942816`}}

1998

{{174.496878032037`,958.3805885783554`,452.90224920712734`,984.0399653895  
328`,  
407.34126994982677`,671.4361259970437`,560.3693167717144`,  
388.60639910694687`,384.1812343964823`,600.6876083624086`,  
573.5368952873331`,557.2886088175771`,603.6576771097932`,  
731.11293946356`,695.6137533845824`,418.78132049699394`,  
691.3091498124234`,725.5026422301537`,663.3007817903706`,  
680.1879145842094`,705.9816948107865`,801.116248732463`,  
603.5252587650059`,750.464747743432`,693.0785227564584`,  
834.0556604751027`,668.1178793297189`,909.4274437876995`,  
601.5089574731171`,549.7380997969484`,589.120765522854`,  
1046.697644632095`,477.48049508072717`,393.33279499307713`,  
483.09621475501984`,278.9699938362391`,277.7274915910333`,  
634.8774982447652`,414.21179306249826`,1005.2362695169181`,  
842.5477526488561`,512.8481237141766`,1755.7139611071545`,

683.5550827607269`,349.06199287691885`,52.548177086986676`,  
229.10310626843628`,697.1352235969844`,620.1474557998879`,  
515.0930208493999`,1070.0387542948438`,1114.3922135614782`,  
632.2917754467144`,736.5885079178402`,959.193838108163`,  
672.4014491432164`,239.0214395238973`,1350.293206`}}