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Foreign bank presence: the experience of South-East European countries during the transition process*

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1. Introduction

One of the main developments that South-East European (SEE) countries were faced with during their transition[1] to a market economy was the influx of foreign banks into the domestic financial system. This transition period saw foreign ownership and control of domestic credit institutions rise dramatically from 8% in 1994 to 52% in 1999 (IMF, 2000), a level which has been maintained to date. The average share of foreign banks rose from 40% in 1999 to more than 60% in 2004. The transition for SEE countries was marked by major institutional changes in the domestic financial systems, frequently as a direct consequence of macroeconomic financial stress and its negative impact on the stability of the financial markets, as well as of severe banking crises.

Since the early 1990s, many countries in the region have implemented financial liberalisation policies, allowing foreign banks to set up branches, and former state-owned domestic banks to become private and partly foreign-owned. In recent years, significant progress has also been made in restructuring and consolidating the banking sector. The implementation of institutional regulatory

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1 In accordance with the definition adopted by the European Bank of Reconstruction and Development (EBRD), the term *transition* refers to the process of establishing democratic institutions and mechanisms in former communist states.

changes and broader financial sector reform has opened up the domestic banking sectors to direct foreign participation.

The pattern and timing of foreign bank entry in emerging financial markets can be attributed to a number of factors (see Clarke *et al.*, 2001): (i) developing host countries are likely to offer substantial profit opportunities in the provision of financial services, since foreign banks face relatively less effective domestic competition and can take advantage of the wider interest rate spreads in these markets; (ii) foreign banks consider that the SEE countries are likely to succeed in their bid for EU entry and that macroeconomic conditions will therefore improve; (iii) considering that financial intermediation increases in line with *per capita* income, retail banking is expected to expand in the host countries as disposable income increases; (iv) foreign bank penetration may accompany or help the entry of non-financial firms; (v) lower host-country tax rates may have a decisive impact on foreign banks' decisions about where to locate and what type of office to establish; and (vi) credit institutions operating on a multinational basis or whose country of origin has more developed financial systems are considered more capable —in terms of expertise and human capital— of restructuring relatively inefficient domestic banks.

Foreign banks have a number of ways of entering a new market and can choose to acquire a domestic credit institution, to set up a subsidiary or to open a regional branch. Each mode of entry has its own specific advantages. For instance, the acquisition of a domestic credit institution usually enables the acquirer to rapidly gain a large share of the market. Moreover, in the case of the SEE countries, the privatisation of domestic banks was possible only as a result of their sale to a foreign bank, since, in most cases, the cost of purchasing the bank was prohibitively high and the governments needed new capital inflows to fund their state budgets.

The present paper analyses the development of the banking sector in the SEE countries during their transition to a market economy. We focus particularly on the position of foreign-owned banks, which have been shown to play an important role in the development of the domestic financial systems. More than half the banks in the region are now foreign-owned, accounting for two-thirds of total bank assets. The rapid growth of foreign control in the banking sector may raise questions about foreign bank entry and its implications for domestic banks. Do foreign banks actually play a role in making domestic banks sounder and more efficient? Does foreign bank entry contribute to more robust domestic financial systems?

The international financial literature provides an overall positive response to these questions, in spite of some negative empirical findings and the formulation of significant counter-arguments. This paper attempts to shed some light on the issue by examining the costs and benefits arising from foreign bank presence in local markets. In particular, we elaborate on earlier findings regarding emerging market economies, exploiting the recent experience of SE Europe. To this end, we used a balance sheet indicator-based analysis to investigate the advantages that foreign banks may enjoy, compared to their domestic competitors. Furthermore, using time-series data from individual bank balance sheets, we performed pooled time series regressions for each

country to test for statistically significant differences across domestically- and foreign-owned banks with regard to loan responsiveness and sensitivity to cyclical fluctuations in GDP.

The rest of our paper is structured as follows: Section 2 gives a summarised overview of the advantages and concerns arising from foreign bank presence, as described in the available literature. Section 3 presents the characteristics of the financial system in SEE countries, with an emphasis on the intermediary role of banks and their level of financial development. In Section 4, we describe the key characteristics of the foreign banks operating in the region. Section 5 examines whether there are major differences between domestically- and foreign-owned banks in terms of lending stability, in order to determine whether foreign bank presence has contributed to the consolidation of the domestic banking system. Finally, our key findings are summarised in Section 6.

2. Foreign bank presence: arguments for and against

The economic literature mentions several channels through which foreign bank presence is likely to affect the performance of the domestic banking sector, either favourably or adversely (see Stiglitz, 1994, Berger and Hannan, 1998, Mathieson and Roldos, 2001, Dages *et al.*, 2000, Crystal *et al.*, 2002). There are five main arguments in favour of opening up emerging market financial sectors to foreign ownership.

First, foreign bank presence increases the amount of funding available to domestic projects, by facilitating capital inflows. Such a presence may also increase the stability of available lending to emerging markets by diversifying the capital and funding bases supporting the overall supply of domestic credit.

Second, foreign banks may stimulate domestic ones to reduce their operating costs and increase efficiency through competition. Indeed, some contend that foreign banks improve the quality, pricing and availability of financial services offered, both directly as providers of these services and indirectly through increased competition with domestic banks (Levine, 1997). At the same time, increased competition may lead to lower interest rate spreads and to lower oligopoly profits.

Third, foreign bank presence may have positive spill-over effects: by introducing new financial services and new banking techniques, foreign banks prompt their domestic counterparts to adopt similar banking techniques in an effort to maintain their market share. This enhancement of the domestic banking system with new business ideas can improve corporate governance, administrative mechanisms and the financial support structure, i.e. administrative accounting and transparency, organisation, information technology and, above all, risk monitoring and management. Foreign banks usually import their parent company's supervisory systems, which, being backed by sophisticated software, more than meet the requirements of the local supervisory authorities. All of these spill-over effects may help establish more efficient domestic banking practices and cost control methods.

Fourth, the presence of foreign banks may improve the quality of human resources working in the

domestic banking system in a number of ways. By attracting highly-skilled managers from the international market, foreign banks transfer considerable know-how, thereby improving the practices adopted by local executives working either for these foreign banks or for their domestic competitors. In addition, by investing in their human resources, foreign banks often improve the quality of the human capital available not only to the financial sector, but also to the domestic economy as a whole.

Finally, by increasing competition and enhancing the role for private capital, foreign bank entry may reduce the importance of financial repression policies (i.e. interest rate controls, directed credit policies). It can also be decisive in reducing government over-reliance on the domestic banking system and thereby improve local bank efficiency.

On the other hand, serious concerns have been voiced about opening up the banking sector to foreign ownership. First, many contend that foreign bank participation puts so much competitive pressure on domestic banks that some may fail in the short run, thus threatening to destabilise the host country's banking sector and economy. Considering that the economies under review have not yet reached maturity, there is a risk that a macroeconomic imbalance in the host country could be transmitted to the home country. Given, however, that nearly all of the state-owned banks in the transition economies have been put up for privatisation, the penetration of foreign banks and the ensuing increased competition are not considered likely to pose major destabilisation threats to the domestic banking systems.

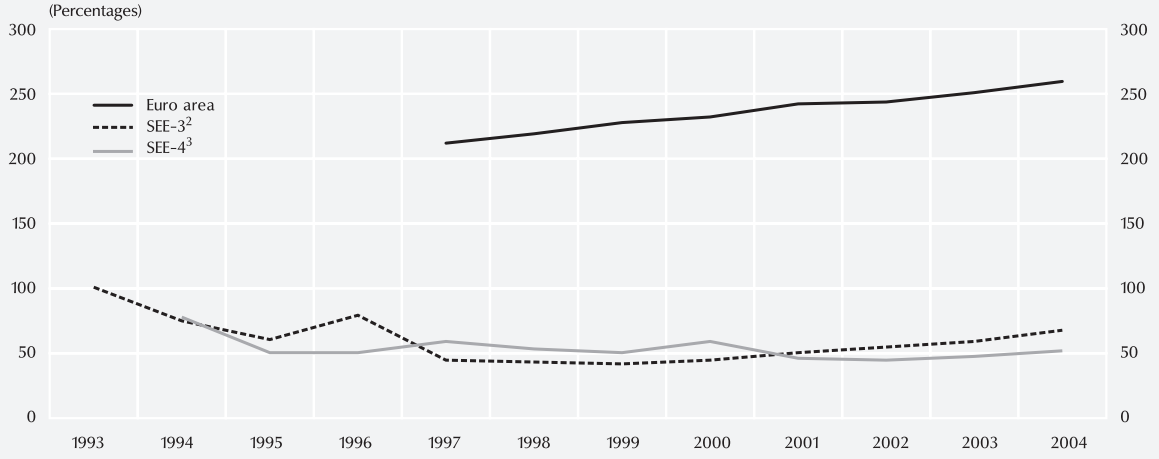
Second, foreign banks could be a cause of instability if they were to decide to reduce their exposure during a time of crisis either in their host or home country.

Finally, some contend that the rapid growth of the domestic banking system as a result of foreign bank presence may significantly undermine the role of the local supervisory authorities, given that the regulatory framework in these countries is not fully developed. However, there are two reasons why this concern seems unwarranted: first, some of the SEE countries have already joined the European Union, in which case their regulatory obligations are determined by EU directives; and, second, the remaining SEE countries that are not EU members must also meet regulatory obligations as determined by co-operation memoranda.

Several papers have already empirically investigated the effects of increased foreign bank presence on domestic banking systems (see, for example, Barajas *et al.*, 2000, Claessens *et al.*, 2001, Clarke *et al.*, 2001, Demizer, 2000, Hermes and Lensink, 2004a, b, Pastor *et al.*, 2000, Naaborg *et al.*, 2004). A finding common to all these papers is that foreign bank presence affects the performance of the domestic banking system by increasing competition. However, to what extent this also leads to greater efficiency is less clear. Finally, most of the concerns mentioned above are unsupported by empirical evidence.

Some studies have reported that costs for domestic banks have increased significantly since foreign bank entry. Hermes and Lensink (2004a, b) have suggested that, at least in the short run, costs may go up depending on the host country's level of economic and financial development. Domestic banks are obviously faced with a trade-

Chart 1
Financial intermediation,[1] 1993-2004
(Percentages)



1 Asset-to-GDP ratio of deposit money banks (end of year).
2 SEE-3: mean for Bulgaria, Romania and Croatia.
3 SEE-4: mean for Albania, FYROM, Serbia-Montenegro and Bosnia-Herzegovina.

Sources: IMF/IFS and National Bank of Serbia.

off between benefits and costs from foreign bank participation. In the short run, costs increase as a result of the investment expenditure needed to upgrade infrastructure and human resources, to improve service and product quality and to introduce new services and products. In the long run, however, previous investment costs will help reduce costs and increase efficiency. As for the impact that foreign bank presence has on the stability of domestic financial systems, Demirgüc-Kunt *et al*. (1998) have shown that foreign bank entry is generally associated with an easier neutralisation of local bank crises and an alleviation of the domino effect.

3. Recent financial development

This section points out some of the basic features of the financial system in the SEE countries, focusing on the intermediary role of banks and on the cross-country differences in financial development.[2]

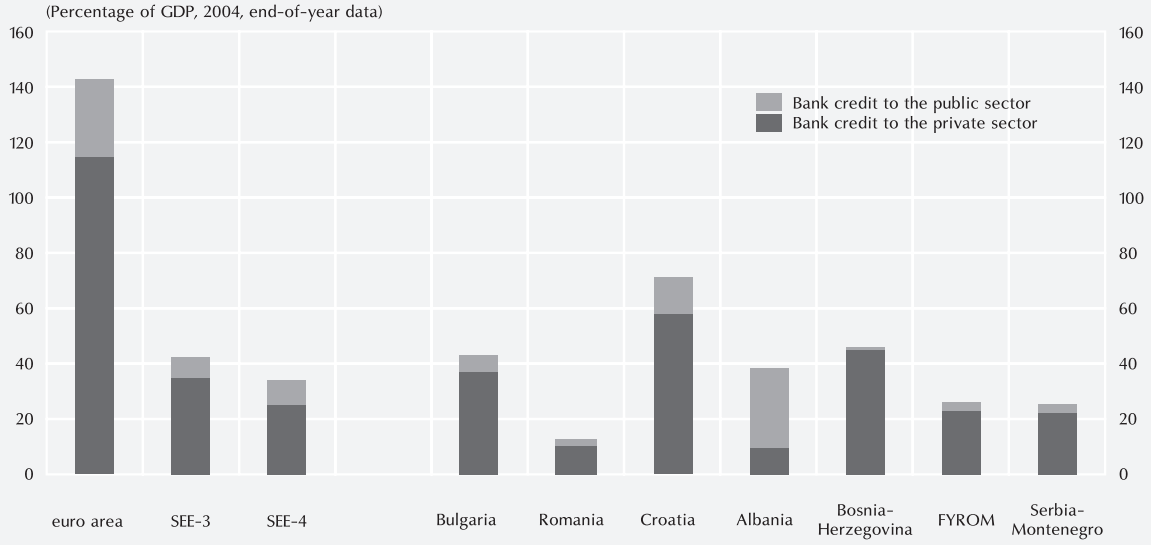
Three financial indices have been used in the literature (see Beck *et al.*, 1999) to measure the degree of financial development and make cross-country comparisons. The first index is the *ratio of deposit money bank*[3] *assets to GDP*, which reflects the importance of the financial services provided by banks relative to the size of the economy. Chart 1 shows how this index has evolved in SEE countries and in the euro area. As can be seen, the

2 The literature available on the region's banking systems is particularly sparse. For a recent study of the determinants of banking profitability in the SEE countries, see Athanasoglou *et al*. (2006).
3 Deposit money banks comprise commercial banks and other financial institutions that accept deposits. Deposit money bank data measure the stock of deposit money. According to the definition of the IMF, the accounts on the assets side are: reserves, comprising domestic currency holdings and deposits with the monetary authorities; claims on monetary authorities, comprising holdings of securities issued by the central bank; foreign assets and claims on other resident sectors (domestic credit).

Chart 2

Bank credit to the private and public sectors

(Percentage of GDP, 2004, end-of-year data)



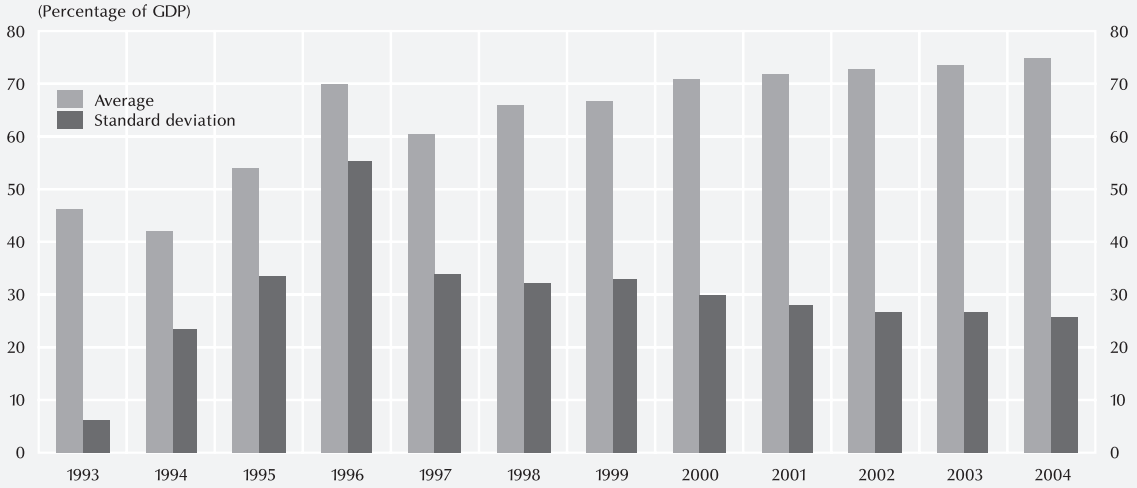
Sources: IMF/IFS and National Bank of Serbia.

ratio exhibits a steady upward trend from 1999 onwards, even though the rate of increase is rather low. However, the average value of this asset-to-GDP ratio is at least four times higher in the euro area than in the SEE countries. The SEE countries in question can be grouped into two categories on the basis of their long-term performance. The first category includes Bulgaria, Romania and Croatia, which have recorded the best macroeconomic performances and the highest levels of *per capita* income. What is more, both Bulgaria and Romania recently joined the European Union. The second category includes the four remaining countries (Albania, FYROM, Serbia-Montenegro and Bosnia-Herzegovina). Even though the degree of banking intermediation is slightly higher in the first of the two categories, the long-run trend is the same for both.

A second index of financial intermediation refers to the level of *deposit money bank claims on the private sector as a share of GDP*. According to the definition used by Beck *et al*. (1999), the numerator captures all loans to the private non-financial sector of the economy. This ratio shows the importance of one of the main functions of financial intermediaries, i.e. the channelling of funds to investors.

Chart 2 plots bank claims on the private and the public sectors as a percentage of GDP for the year 2004. As can be seen, the SEE countries do not display a uniform pattern of financial development. Private credit in relation to GDP is by far highest in Croatia, the only country in the sample with a financial sector somewhat comparable in size to that of the euro area. Credit as a percentage of GDP amounts to 115% in the euro area, but is more than 3 and 4 times lower in the SEE countries (35% and 25% respectively in the first and second categories of the sample). Still, there are major differences between these countries: bank

Chart 3
Bank credit to the private sector, 1993-2004
(Percentage of GDP)



Note: Average and standard deviation of commercial bank credit to the private sector as a percentage of total bank credit (seven countries, end of year).

Sources: IMF/IFS and National Bank of Serbia.

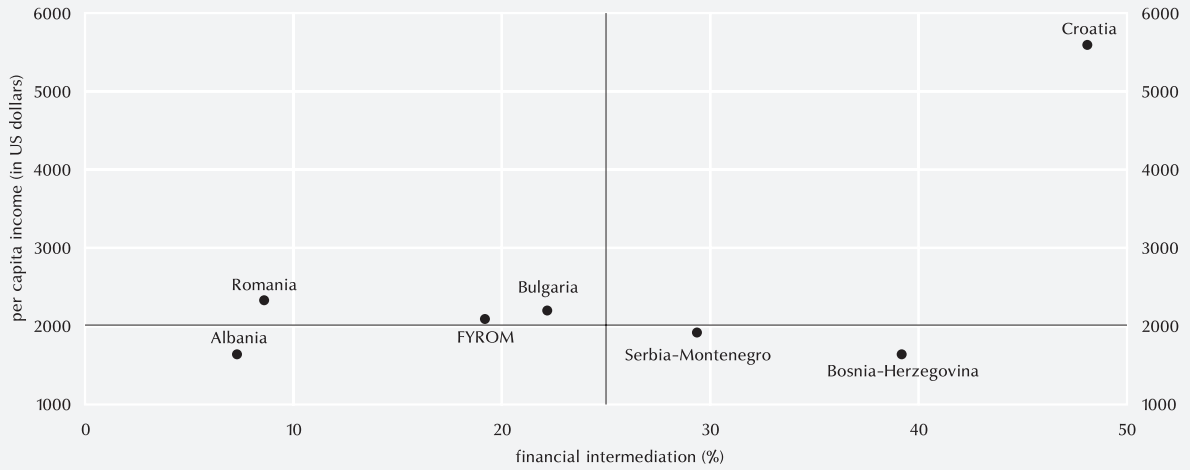
lending to the private sector, as a percentage of GDP, ranges from a high of 57% in Croatia to a low of 10% in Romania. However, all countries exhibit an upward trend in private credit, whereas the trend of public sector credit is decreasing. The ratio of public sector credit to GDP amounts to 6% in Bulgaria, 13% in Croatia and 28% in Albania, but to no more than 3% in the remaining countries. By comparison, euro area public credit in 2004 was 28%.

Private credit rose markedly in the period from 1993 to 2004. As the rate of economic growth in these countries becomes faster, private credit also increases. The reason for this is simple: due to the underdeveloped domestic credit systems and the shallow domestic stock markets, the only option for private investors to cover their increased needs in money funds is bank lending. Commercial banks are gradually becoming all the more willing to finance private investment projects. Indeed, as can be seen in Chart 3, average annual credit to the private sector, as a percentage of total bank credit extended by commercial banks in the region, rose from 46% in 1993 to 75% in 2004. Meanwhile, the standard deviation between countries fell significantly from 55% in 1996 to 26% in 2004, indicating that bank behaviour in the sample countries is becoming more uniform over time.

The third index monitors the *correlation between financial development and per capita income*. The literature on finance and economic development (see King and Levine, 1993a, b, Levine, 1997, Levine *et al.*, 2000, Khan and Senhadji, 2000) suggests that the volume of banking activity increases with rising *per capita* income. As shown in Chart 4, countries with higher *per capita* income, like Croatia and Bulgaria, have more developed banking systems. By contrast, countries like Albania and FYROM are charac-

Chart 4

Financial intermediation and per capita income



Note: The degree of financial intermediation is measured as the ratio of private credit to GDP. Data are end-of-year and averages for 2000-2004.

Sources: IMF/IFS and EBRD.

terised by low *per capita* income and a low level of banking intermediation. However, this observation is not confirmed in all cases. For instance, in Romania private credit as a share of GDP is unexpectedly low, whereas the *per capita* income is higher than in Bulgaria. Similarly, Bosnia-Herzegovina posts the second highest credit to GDP ratio in the sample, but along with Albania has the lowest *per capita* income.

To sum up, there are substantial differences between the SEE countries in terms of their banking sector development. Croatia, Bulgaria and Bosnia-Herzegovina have more developed banking systems, while Albania, Romania and Serbia-Montenegro lag behind. FYROM has a relatively low level of banking intermediation, but is striving to catch up with its more developed counterparts in the region. Although the differential with the euro area is still particularly wide, all three indices used exhibit a long-run upward trend, indicating that these countries are making efforts to build healthy banking sectors.

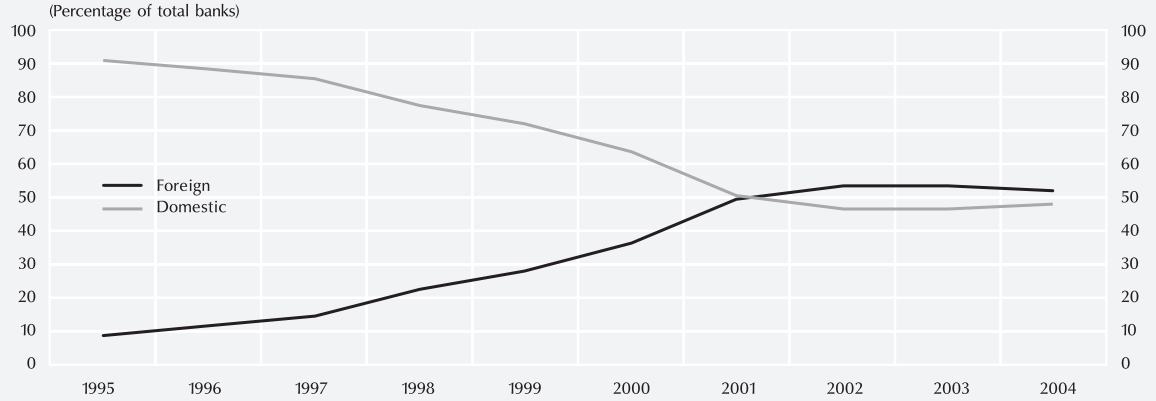
4. Foreign bank presence: key characteristics

Foreign bank entry in SE Europe began in the early 1990s when these countries started transitioning to a market economy and, in fact, was one of the determining factors in the transition process. Based on end-2003 and end-2004 data, foreign banks in the region have a much stronger presence than their domestic counterparts, both in terms of assets and network size. By the end of 2004, foreign investors had assumed control of more than 50% of total banks in the sample countries, compared with just 8.6% at end-1995. The average asset share of foreign banks rose from 40% of total bank assets at end-1999 to 66% at end-2004. Based on data for the year 2004, for-

Chart 5

Number of foreign and domestic banks, 1995-2004

(Percentage of total banks)



Note: Foreign banks = number of commercial and savings banks, excluding co-operative banks. Banks are defined as "foreign" when no less than 50% of their total equity is owned by foreigners. Domestic banks = private and state-owned. Banks are classified as "state-owned" when no less than 50% of their equity is owned by the state. This last category comprises credit institutions operating at a federal, national, regional or even local level, as well as credit institutions controlled by state-run insurance funds. Bosnia-Herzegovina is not included in the 1995 figures due to a lack of data. All data are end-of-year for the seven countries.

Source: EBRD.

Table 1

Number of foreign-owned banks in SE Europe

Countries	1995*	2000	2001	2002	2003	2004
Croatia	1	21	24	23	19	15
Bulgaria	3	25	26	26	25	24
Romania	8	21	24	24	21	23
Albania	3	12	12	12	13	14
Bosnia-Herzegovina	–	14	20	21	19	17
Serbia-Montenegro	3	3	8	12	16	11
FYROM	3	7	8	7	8	8
Total	*21*	*103*	*122*	*125*	*121*	*112*
% of total number of banks	*8.6*	*36.3*	*49.6*	*53.4*	*53.6*	*52.1*

* Bosnia-Herzegovina is not included due to a lack of data.
Source: EBRD.

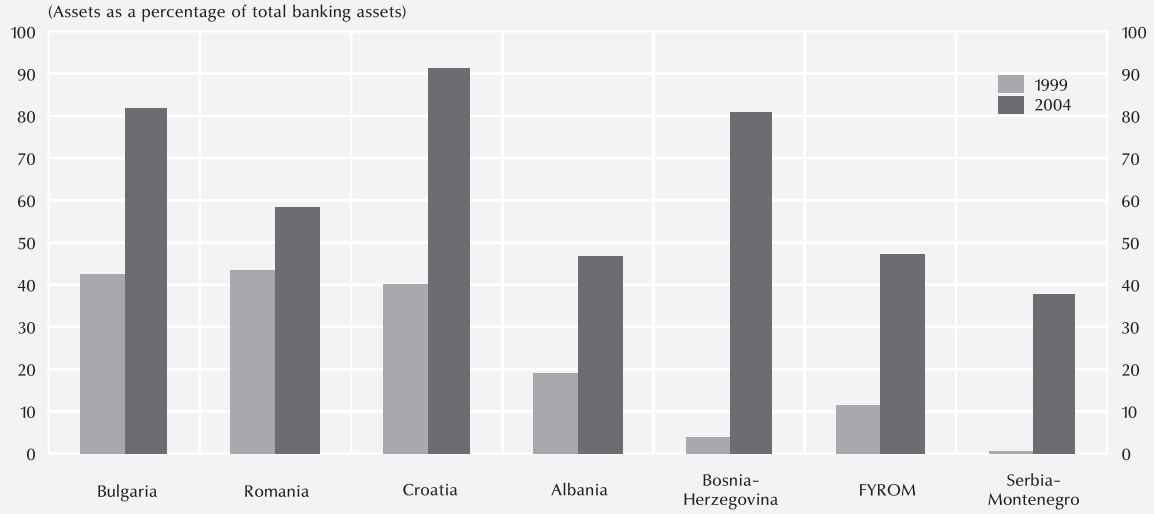
eign bank asset share varied from a low of 37.7% in Serbia-Montenegro to a high of 91.2% in Croatia.

Chart 5 illustrates the development over time in the relative number of foreign and domestic banks (either private and state-owned) for the period 1995-2004, while Table 1 gives the absolute number of foreign banks in each country. In 1995, 21 foreign banks were present in our sample, accounting for 8.6% of total banks. By 2004, the number of foreign banks had climbed to

Chart 6

Share of foreign banks in total banking assets

(Assets as a percentage of total banking assets)



Note: Due to a lack of data, the more recent figure for Albania is from end-2003.

Source: EBRD.

112, accounting for more than 50% of the total. By contrast, the number of domestic banks fell from 222 (91%) at end-1995 to 103 (48%) at end-2004. Apart from the developments over time in the number of foreign and domestic banks, it is also interesting to examine the differences across countries. The number of foreign banks grew much faster in some countries than in others. Foreign bank presence is strongest in Bulgaria, Croatia, Romania and Albania.

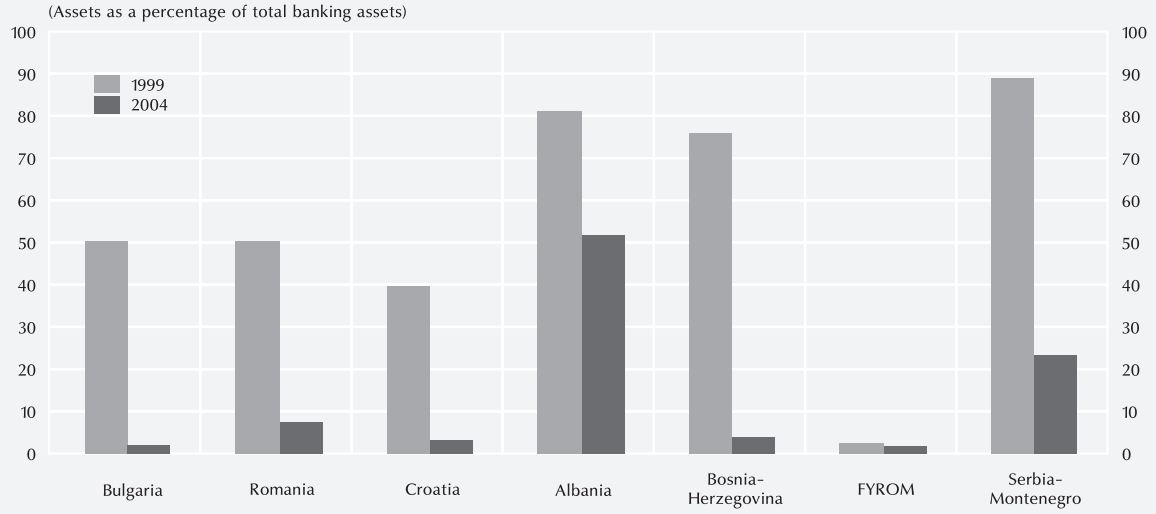
According to Charts 6 and 7, which show foreign- and state-owned bank assets as a percentage of total bank assets, foreign bank penetration grew significantly between 1994 and 2004. Foreign banks control majority market shares in all SEE countries, while the share of banking assets under state control has substantially decreased.

More specifically, after examining the situation in the financial sector of each of the sample countries, we can note the following: banking sector consolidation, via mergers and acquisitions, has continued at a vigorous pace in Bosnia-Herzegovina, with 33 banks in operation at end-2004, down from 37 one year earlier. Half of these banks are foreign-owned and some two-thirds of total bank capital belongs to foreign shareholders. Confidence in the country's banking system has been boosted and financial intermediation has expanded significantly in recent years. Similarly, in Albania, the banking system has undergone substantial changes and the banking sector is now the most important segment of the country's financial system. Fourteen of the total 16 banks in operation at end-2004 were foreign-owned. Since the sale, in the first half of 2004, of the Savings Bank, the country's largest state-owned bank, practically the entire banking sector has come under private management. FYROM's banking sector continues to be marked by a low level of financial intermediation and

Chart 7

Share of state-owned banks in total banking assets

(Assets as a percentage of total banking assets)



Note: Due to a lack of data, the more recent figure for Albania is from end-2003.

Source: EBRD.

competition and is dominated by three major banks. Further consolidation in the sector is necessary, as several small banks are reported to be in difficulty. Eight of the country's total 21 banks are foreign-owned, with an asset share of 47%. Financial intermediation in Serbia-Montenegro has progressed significantly and confidence in the system has recovered. In Serbia, the banking sector has consolidated significantly, after the sale of several state-owned banks to foreign investors. However, the banking sector is still "over-banked", with more than 40 banks in operation at end-2004.

In Bulgaria, the privatisation of the banking sector, which began in 1997, has neared completion, with more than 80% of the country's total banking assets in the hands of foreign-owned institutions. At the end of 2004, 24 of the 35 banks operating in the country were foreign-owned. Competition in the sector is intense, and an increasingly broader range of financial products and services is offered. Reform efforts are now focusing on establishing the bank insolvency regime. In Croatia, the banking sector has strengthened and its creditworthiness has improved significantly. This has come as a result of a radical capital restructuring effort, carried out primarily by foreign-owned banks, which today account for more than 90% of the country's banking assets. However, sector concentration is exceptionally high, with the top two banks holding some 43% of total assets. The banking sector continues to expand, thanks to strong domestic demand for bank lending. Finally, in Romania, the government has stepped up the privatisation of state-owned banks. By end-2004, only two banks out of a total of 32 were still under state ownership and control, with a combined asset share of 8%. Twenty-three banks were foreign-owned and accounted for nearly 60% of total assets.

5. Foreign versus domestic banks: behavioural indicators

In this section, we will examine the differences in behaviour across domestic and foreign banks in order to assess whether foreign bank entry has contributed to more robust financial systems in SE Europe. One approach to evaluating the soundness of domestic and foreign banks focuses on balance sheet and behavioural indicators.

5.1 Data analysis

So far, our analysis has been based on country-aggregated statistical data.[4] However, in order to compare the behavioural indicators of domestic and foreign banks, we need statistical data for each individual bank. The only source of bank-level data series in a comparable form is the Fitch IBCA BankScope database, which provides balance-sheet and profit-and-loss data for each bank, as published in their annual reports but adjusted for differences in reporting and accounting standards. In order to meet the requirements of the present study, however, certain data classification problems needed to be resolved. First, the BankScope database does not specify a bank's home country, i.e. whether it is domestically- or foreign-owned, nor does it indicate when a bank became foreign-owned. Second, the database does not always list all the banks in operation in a domestic market, whereas it sometimes lists banks which have ceased operating due to bankruptcy or dissolution. Third, since the database does not list all the branches of a foreign bank present in the local market, foreign bank presence may be underestimated.

For the purposes of our study, we gathered information from the financial statements of 101 banks in operation in the seven countries of SE Europe during the period 1999-2004.[5,6] Our sample selection procedure was designed to meet the following prerequisites: first, the banks needed to have a presence of at least three consecutive years in the local market and, second, their financial statements had to be in accordance with international accounting standards. Therefore, banks in operation for fewer than three consecutive years or no longer active due to bankruptcy or liquidation were excluded from the sample, as were banks which follow domestic rather than international accounting standards for reasons of non-comparability. Information about the banks' specific features (year of establishment, country of origin, domestic or foreign ownership, the year they became foreign, name change, etc.) was derived from the banks' websites and annual reports, as well as from the respective national central banks, and is presented in table form in the Appendix. Recourse to supplementary sources of information (such as Euromoney Institutional Investors PLC) was necessary in order to divide the sample banks into two sub-samples: domestic and foreign[7] banks. Finally, domestic banks which have been

4 Main sources of macroeconomic data are the International Monetary Fund, the EBRD and the national central banks.

5 Accounting data were used for banks listed as "commercial banks" and "savings banks", in accordance with the categories used in the BankScope database. All quantitative data were taken from the updated November 2006 version.

6 Because of the time lag before country-aggregated and bank-level data are actually released, we decided that 2004 would be our cut-off year. Due to this restriction, it was not possible to extend the sample period to 2005, a year which saw a major influx of foreign banks into the region, especially in Serbia-Montenegro.

7 Beck *et al.* (1999) define a bank as foreign-owned if no less than 50% of its equity is owned by foreigners, and foreign-penetrated if more than 5% but less than 50% of its equity is held by foreign investors. This same definition was used in this study in order to distinguish domestically-owned banks from their foreign-owned counterparts.

acquired by foreign investors were classified in the foreign bank sub-sample only the second year after their acquisition, i.e. only after their annual financial statements had been published for the second time under the new ownership structure. We therefore allowed for an adjustment period of more than 12, but less than 24 months, since the items are published at the end of each year.[8]

5.2 Summary performance and risk measures

Commercial banks of different ownership (domestic or foreign) may have different operating characteristics. Claessens *et al.* (2001) provide empirical evidence that foreign banks are more profitable and efficient than domestic ones in developing countries, while the opposite is true in developed countries (see also Berger *et al.*, 2000, De-Young and Nolle, 1996).[9] In order to determine to what extent foreign banks in SEE countries may be more efficient, both in terms of cost and profit efficiency, we investigated a number of performance indicators for both domestic and foreign banks.

More specifically, we chose to investigate: (i) the return on assets (ROA), which equals net income to average total assets;[10] (ii) the return on equity (ROE), defined as net income to average equity; (iii) the equity-to-assets ratio, which corresponds to the inverse of the equity multiplier; (iv) the profit margin, which equals 'after tax' income to total income (interest plus non-interest income before expenses, tax and provisions for loan losses); and finally (v) asset utilisation, which equals total income before expenses and taxes to average total assets. All of these indicators reflect a bank's profitability.

The ROA measures bank profits per unit of assets, whereas the ROE, which represents the aggregate return to stockholders before dividends, measures profitability from the shareholders' perspective. The higher the return, the better for shareholders, as banks can add more to retained earnings and pay more in cash dividends when profits are higher. The ROE is linked to the ROA by the equity multiplier, which is given as the ratio of average total assets to average total equity. The equity multiplier —which is the inverse of the unweighted equity capital indicator, i.e. the ratio of average equity to average assets unweighted for risk— in fact measures financial leverage and represents both a profit and risk measure. This is because a bank's equity multiplier compares assets with equity, so that high equity-to-asset ratio values indicate that the bank has a large amount of debt financing relative to stockholders' equity. A low value of the equity-to-assets ratio, on the other hand, means that the bank is operating with less equity and more debt. The ROE's primary shortcoming as a measure of bank performance is that it can be high because a bank has inadequate equity capital.[11] Thus, the ROA provides a clearer accounting measure of overall

8 This assumption is likely to have had a significant impact on our results. However, a sensitivity analysis of this assumption would have been beyond the scope of our study.

9 Differences in tax and regulatory regimes, customer bases and informational advantages might have a differential impact on bank profitability and efficiency.

10 Net income equals total revenue less total operating expenses and income tax. Total revenue equals the sum of interest income, non-interest income and securities gains and losses. Average total assets are defined as the average value of total assets at the end of two consecutive years, as recorded in the banks' financial statements.

11 A bank with negative book equity (insolvency) and positive profits would show a negative ROE, whereas a bank with negative book equity and negative profits would show a positive ROE. For a discussion of the shortcomings of the ROE, see Koch and McDonald (2005, chapter 3) and Sinkey (2002, chapter 3).

bank performance, in the sense that it measures how profitably a bank's on-balance-sheet assets are employed.

The profit margin focuses on a bank's ability to capitalise expenses, while asset utilisation expresses total revenue per unit of assets. The greater the asset utilisation, the greater the bank's ability to generate income from the assets it owns.

A few other, commonly-cited, aggregate profitability measures were computed for the purpose of our study, such as the net interest margin, overhead costs and the efficiency ratio. The net interest margin, defined as the bank's net interest income to average total earning assets, is a summary measure of net interest return on income-producing assets. It signals credit market efficiency and is very important in evaluating a bank's ability to manage interest rate risk. As interest rates change, so does a bank's interest income. For instance, if interest rates increase, so will the bank's net interest income, given that some assets and liabilities will be revalued at higher rates, i.e. in line with the sensitivity of both sides of the balance sheet to interest rate changes. Variations in the net interest margin indicate whether a bank has positioned its assets and liabilities to take advantage of rate changes and namely whether it has profited or lost from increases or decreases in interest rates.

As far as operational efficiency is concerned, a bank's overhead costs, defined as the ratio of its non-interest costs to average total assets, provide valuable information with which to make comparisons across different-sized banks. The numerator includes personnel expense (salaries and benefit payments), occupancy expense and other operating expenses. Non-interest costs may vary from bank to bank depending on the composition of the banks' liabilities. For instance, banks with large amounts of saving accounts and transaction deposits exhibit greater relative overhead costs.

The efficiency ratio is defined as the ratio of non-interest costs to the sum of net interest income and net non-interest income. It measures a bank's ability to control non-interest costs relative to operating income. Conceptually, therefore, it indicates how much a bank must "pay" in non-interest expenses, i.e. in overheads, for each additional unit of operating income. Bank analysts usually expect larger-sized banks to keep this ratio below 55%. Banks use this ratio to estimate how effective their recent efforts to control non-interest costs have been, while supplementing earnings by increasing fees on a wide range of transactions. The smaller the efficiency ratio, the more profitable the bank, *ceteris paribus*.

A third group of indicators analysed here involves asset quality. The two measures in question reflect the amount of existing credit risk associated with the loan and investment portfolio as well as with off-balance-sheet activities. More specifically, the first indicator measures a bank's loan loss reserves, based on the balance sheets, as a percentage of total gross loans, while the second indicator calculates the amount of loan loss provisions based on the profit and loss account (this sum on an accounting basis usually provides an estimate of credit risk costs) as a percentage of net interest income.

Finally, the position of the sample banks is examined in terms of liquidity. Ideally, liquidity should reflect the adequacy of the credit institutions' cur-

Table 2
Summary profitability and risk measures (I: profitability – returns)
(End of year, 1999-2004 averages, percentages)

	Bulgaria	Romania	Croatia	Albania	Bosnia-Herzegovina	FYROM	Serbia-Montenegro
Domestic banks							
Return on assets (ROA)	2.0	2.2	1.0	1.5	0.3	1.3	1.0
Return on equity (ROE)	12.8	12.0	9.7	54.3	1.5	6.9	3.4
Equity capital ratio	14.7	16.8	10.3	1.4	15.7	18.6	24.0
Profit margin	23.6	18.7	17.3	48.3	4.2	15.6	0.9
Asset utilisation	8.5	11.8	5.8	3.1	9.0	8.7	21.1
Foreign banks							
Return on assets (ROA)	1.6	2.1	1.7	1.1	1.2	0.1	1.3
Return on equity (ROE)	11.2	13.5	16.9	11.7	10.2	-0.3	22.5
Equity capital ratio	13.8	15.1	9.6	10.8*	13.8	15.5	5.7**
Profit margin	22.3	20.5	26.2	21.5	12.0	0.4	18.2
Asset utilisation	7.4	10.4	6.8	5.2	10.6	7.3	7.3

Note: Authors' calculations. For Albania, the sample period is: 2000-2004. The total number of banks in the sample is as follows: Bulgaria 23, Romania 21, Croatia 23, Albania 5, Bosnia-Herzegovina 11, FYROM 11, Serbia-Montenegro 7. For FYROM, the sample period for foreign banks is: 2001-2004. For Serbia-Montenegro, the sample period for foreign banks is: 2002-2004. (*) 1999-2004, (**) 2001-2004.
Source: BankScope.

rent and prospective sources of liquidity and fund management practices. For the needs of the present study, however, we used the standard net loans (i.e. after loan loss provisions) to total assets ratio to measure the ease with which banks can liquidate their assets.

All of the aforementioned variables were directly calculated using data from the banks' financial statements. More specifically, the sum of the net interest income and non-interest income equals profits, less overheads and loan loss provisions. Changes in non-interest income, profit margins and overheads affect profits, which constitute the residual variable in the banks' financial statements.

The indicator figures are presented in Tables 2, 3 and 4, and, in general, are characterised by internal consistency. The banks with lower net interest margins and higher overhead costs (non-interest expenses) typically have a lower ROA.

Tables 2 and 3 provide the average performance indicators separately for domestically- and foreign-owned banks over the period 1999-2004. With regard to the domestically-owned banks, Serbia-Montenegro stands at one end of the spectrum, with the second highest net interest margin after Romania. However, because of its particularly high overhead costs, which are nearly double the average of the other SEE countries, the advantages of favourable product and service pricing

Table 3

Summary profitability and risk measures (II: efficiency)

(End of year, 1999-2004 averages, percentages)

	Bulgaria	Romania	Croatia	Albania	Bosnia-Herzegovina	FYROM	Serbia-Montenegro
Domestic banks							
Net interest margin	6.4	10.5	3.9	2.7	5.5	6.0	8.0
Overhead costs	5.6	6.8	3.8	1.1	6.0	4.7	10.6
Efficiency ratio	66.1	58.2	66.2	36.5	66.8	55.5	55.2
Foreign banks							
Net interest margin	5.1	8.6	4.7	4.4	6.9	3.8	5.9
Overhead costs	5.1	6.2	3.8	2.9	6.6	4.7	5.3
Efficiency ratio	68.6	59.8	57.2	56.9	63.0	64.4	73.1

Note: Authors' calculations. For Albania, the sample period is: 2000-2004. For FYROM, the sample period for foreign banks is: 2001-2004. For Serbia-Montenegro, the sample period for foreign banks is: 2002-2004.
Source: BankScope.

Table 4

Summary profitability and risk measures (III: Asset quality and liquidity)

(End of year, 1999-2004 averages, percentages)

	Bulgaria	Romania	Croatia	Albania	Bosnia-Herzegovina	FYROM	Serbia-Montenegro
A. Domestic banks							
Asset quality							
Loan loss reserves (LLR) to gross loans	7.7	7.2	11.6	31.9	12.0	15.3	21.4
Loan loss provisioning (LLP) to net interest income	12.8	14.7	19.5	–0.1	50.2	65.2	123.8
Liquidity							
Net loans to total assets	39.7	31.6	44.7	0.9	43.9	37.6	42.9
B. Foreign banks							
Asset quality							
Loan loss reserves (LLR) to gross loans	6.1	4.2	8.6	6.5*	7.8	8.4	3.0**
Loan loss provisioning (LLP) to net interest income	3.6	10.2	21.3	41.4*	48.2	81.4	9.0**
Liquidity							
Net loans to total assets	41.4	43.5	55.2	22.7*	48.6	34.3	25.0**

Note: Authors' calculations. For Albania, the sample period is: 2000-2004. For FYROM, the sample period for foreign banks is: 2001-2004. For Serbia-Montenegro, the sample period for foreign banks is: 2002-2004. (*) 1999-2004, (**) 2001-2004.
Source: BankScope.

are lost. As a result, the ROA is a mere 1.0% – the second lowest ratio of all the SEE countries after Bosnia-Herzegovina. At the other end of the spectrum lies Albania: although its performance in terms of net interest margin is the poorest in the region —either as a result of the competitive pricing conditions in Albania, which lead to lower profits from interest bearing assets, or due to the higher costs of raising capital— the country nonetheless enjoys the third highest ROA after Romania and Bulgaria, due to the fact that overhead costs are particularly low (the indicator stands at 1.1%, while the next best performance is that of Croatia, at 3.8%).

Staying on the subject of Albania, particularly interesting conclusions can be drawn from comparing domestic and foreign banks. Net interest margins are much higher among foreign banks (4.7%) than among domestic banks (2.7%), due to the fact that it is cheaper for foreign banks to raise funds than it is for their domestic counterparts, since both categories will basically have the same pricing policies. However, this does not mean that foreign banks in Albania ultimately enjoy higher profitability,[12] since their better performance in terms of net interest margins is more than offset by the higher overhead costs indicator recorded for foreign banks relative to their domestic counterparts (foreign banks: 2.9%, domestic banks: 1.1%).[13] This poorer performance of foreign banks in terms of overhead costs is associated, first, with the fact that the time period under examination was one where most of the foreign banks were just entering Albania and were, therefore, faced with high infrastructure and restructuring costs when proceeding with acquisitions. Second, the foreign banks were forced to pay considerably higher salaries in order to win over executives from their domestically-owned counterparts or from abroad. Foreign bank presence has, therefore, clearly enhanced the development of Albania's domestic banking sector in a number of ways: cheaper fund raising and fund inflows into the country, competitive yield offers, the creation of new, frequently better paid, jobs, and high infrastructure investment. From a macroeconomic perspective, the combined outcome of all these developments was an increase in domestic consumption and investment and, consequently, an increase in national income.

Of course, the high infrastructure and restructuring expenses initially incurred by foreign investors when acquiring domestic banks make it difficult, when limiting ourselves to the period covered by the present study, to draw definite conclusions about the efficiency of foreign banks. This explains why, in most instances (except for Croatia and Bosnia-Herzegovina), the ratio of non-interest costs to average total assets is higher for foreign banks than it is for domestic ones.

Concerning portfolio quality indicators (see Table 4), foreign banks are clearly in a much better position than their domestically-owned counterparts. Reserves for loan loss provisions as a percentage of gross loans are higher for domestic banks than

12 A factor widely commented on in the literature as a determinant of profitability is bank size, which can affect profitability in a number of ways, e.g. as a result of economies of scale and scope or through oligopoly profits ensuing from a greater market share. A further investigation of the correlation between bank size and profitability in the countries under examination could help researchers interested in the role of foreign banks to statistically isolate the bank size factor.

13 The higher overhead costs borne by foreign banks are due, in part, to the fact that the domestic credit institutions that were acquired by foreign banks had particularly high overheads, chiefly because of inflated staff levels. In fact, most of the acquisition agreements reached contained explicit "no layoff" clauses.

for foreign ones in all the SEE countries, implying that foreign banks are far more certain to reap future profits. The ratio of provisions for loan losses (recorded in the profit-loss accounts) to net interest income is, in most cases, higher for domestic banks. This means that the credit risk costs arising either from new loans or from negative developments associated with older loans are higher for domestic banks, which explains why the latter create higher reserves for such provisions on their balance sheets. Any increase in "credit risk costs" implies that the return on interest-bearing assets will not be sufficient to cover the risk costs associated with these assets.[14]

Finally, it is worth noting that the net loans-to-total assets ratio is higher for foreign banks in all the SEE countries except for FYROM, indicating that foreign banks have a stronger credit expansion. In addition, the fact that foreign banks can easily secure liquidity from their parent bank abroad and can borrow at a lower cost from international capital markets because of their generally higher international credit ratings means that it is less imperative for them to hold a significant proportion of their capital in liquid form.

5.3 Bank lending activity: Pattern comparisons

Lending patterns vary across domestically- and foreign-owned banks to the extent that there are corresponding differences in (i) bank lending motives with respect to their customers; (ii) the quality of bank balance sheets; and (iii) the banks' sources of loanable funds (see Dages *et al.*, 2005, Crystal *et al.*, 2002). These differences can influence the interest rate sensitivity of the loan supply and the extent to which a bank expands or contracts lending in response to various local market signals. The interest rate sensitivity of lending is likely to be higher for banks with closer ties to international capital markets and with wider access to profitable investment opportunities, i.e. banks with foreign affiliates. In contrast, state-owned banks are expected to have the lowest interest rate sensitivity, since higher profitability is more of a motive for private banks than it is for state-owned ones.

Lending motives, the quality of bank balance sheets and the availability of loanable funds can affect bank responsiveness to market signals. Analytically, through "transaction-based lending", improved economic conditions generate opportunities for expanding production and investment. Therefore, bank loans expand to accommodate part of this demand. Through "relationship lending", bank lending helps established customers smooth over the effects of cyclical fluctuations on consumption. For instance, under adverse economic conditions, lending expands to offset some of the revenue shortfall of clients, whereas, under favourable economic conditions, lending by banks declines, as borrowers pay back outstanding loans. Therefore, "relationship lending" is countercyclical, whereas "transaction-based lending" is generally procyclical.

Healthy foreign bank presence fills a domestic vacuum by providing finance for worthwhile local

14 The above findings should be interpreted with caution. The difference in the level of doubtful claims results from differences in the distribution over time of older claims contained in the portfolios of foreign and domestic banks, but is also affected by the production of new loans. The foreign banks either set up direct subsidiaries, which do not yet have mature portfolios close to the "natural doubtful percentage", or acquired domestic banks. In the latter case, the low percentage of doubtful loans is an attractive factor, since it entails less insecurity with regard to the true value of net financial flows originating from the bank which is being acquired.

Table 5
Share of foreign banks in total lending by the sample banks, 1999-2004
(Percentages of total lending)

Year	Bulgaria	Romania	Croatia	Albania	Bosnia-Herzegovina	FYROM	Serbia-Montenegro
1999	13.6	38.4	10.1	51.2	31.9	–	–
2000	28.4	44.7	40.1	88.9	32.2	–	–
2001	57.4	47.0	47.6	93.4	54.3	40.0	7.4
2002	58.5	45.0	48.4	97.5	75.9	40.4	9.9
2003	67.0	48.2	81.7	98.1	86.6	47.6	20.2
2004	82.0	51.1	89.2	97.2	93.7	51.0	29.9

Note: Bank lending (loans and advances) to households and firms. Loans are net of loan-loss reserves. For Serbia-Montenegro and FYROM, the sample period is: 2001-2004.
Source: BankScope, bank balance sheets.

projects, since domestic banks, often due to their more moderate performance and their difficulties in raising loan capital, are not in a position to provide adequate funding. Obviously, the more heavily a bank relies on domestic deposits, the more likely it is that domestic aggregate demand shocks will lead to more volatile lending. Thus, banks with narrower funding bases are, *ceteris paribus*, more likely to present a greater degree of lending cyclicality.

Finally, the *quality* of bank balance sheets can influence bank responsiveness to market signals, as banks focused on balance-sheet repair will concentrate less on expanding loan availability to fund profitable investment plans and expand lending to meet increased total demand.

In this section, we will document some patterns in bank lending activity across banks operating in the SEE countries, focusing our investigation on whether ownership *per se* may or may not be a reason to expect differences in the lending patterns of domestically- and foreign-owned banks. The simple stylised facts we present provide factual evidence as to whether foreign banks have deepened or diversified domestic loan supply and whether or not easy access to lending has diminished the sensitivity of lending to market signals. Diminished sensitivity means less bank lending volatility to local cycles.

Details on the composition of bank loans by owner type as a percentage of total bank lending are presented in Table 5. It appears that foreign banks are making robust efforts to increase their share of the local market, while domestic banks are making similarly robust efforts to maintain their share. Generally, the strong presence of foreign banks is indicative of the significant role they play in funding the local economy. Indeed, corporate and household credit from foreign banks has increased significantly in recent years. Between 1999 and 2004, foreign bank lending increased two-fold and three-fold in Albania and Bosnia-Herzegovina and as much as six-fold to nine-fold in Bulgaria and Croatia, respectively. By contrast, domestic bank lending decreased significantly.

Table 6

Average bank loan growth, 1999-2004

(Annual percentage changes, unweighted average across individual banks)

Year	Bulgaria	Romania	Croatia	Albania	Bosnia-Herzegovina	FYROM	Serbia-Montenegro
A. Domestic banks							
1999	31.9	–26.2	–5.9		10.5	–	–
	(1.6)	*(–0.9)*	*(–2.3)*		*(3.4)*		
2000	25.9	–18.5	–4.9		40.3	18.8	62.6
	(3.5)	*(–0.9)*	*(–2.8)*		*(0.6)*	*(0.9)*	*(1.2)*
2001	79.6	–17.3	23.4		21.8	6.2	6.0
	(1.5)	*(–1.9)*	*(0.9)*		*(1.7)*	*(3.0)*	*(9.2)*
2002	37.6	157.7	37.7		46.6	37.6	57.2
	(1.2)	*(3.1)*	*(0.8)*		*(0.4)*	*(2.5)*	*(1.5)*
2003	73.4	92.0	17.0		8.2	13.8	3.1
	(0.5)	*(1.4)*	*(0.3)*		*(4.6)*	*(2.2)*	*(3.9)*
2004	37.5	37.6	9.6		12.1	47.1	16.7
	(0.3)	*(1.3)*	*(1.4)*		*(1.3)*	*(1.0)*	*(1.4)*
B. Foreign banks							
1999	28.7	50.1	32.5	–	90.9	–	–
	(1.3)	*(1.4)*	*(1.9)*		*(0.8)*		
2000	30.1	43.7	25.9	84.7	25.9	–	–
	(0.6)	*(2.8)*	*(0.9)*	*(0.3)*	*(2.0)*		
2001	33.3	3.4	42.2	9.8	84.4	5.3	–
	(0.7)	*(13.7)*	*(0.7)*	*(2.4)*	*(0.7)*	*(6.3)*	
2002	64.8	51.6	38.7	39.3	60.0	27.8	178.7
	(0.9)	*(1.4)*	*(0.6)*	*(1.1)*	*(1.1)*	*(1.1)*	*(0.8)*
2003	30.3	20.4	28.5	56.6	41.0	46.9	145.8
	(1.0)	*(1.6)*	*(1.4)*	*(1.1)*	*(0.7)*	*(0.4)*	*(0.5)*
2004	35.5	25.5	13.6	42.2	61.6	36.0	73.9
	(0.8)	*(1.3)*	*(0.9)*	*(1.1)*	*(0.9)*	*(0.2)*	*(0.3)*

Note: The coefficient of variation is reported in parentheses. This relative measure of variability is defined as the ratio of standard deviation to the series' mean. Calculations use real balances of outstanding net loans of individual banks. Lending volumes are taken by deflating nominal values by the consumer price index (CPI). For Serbia-Montenegro, the sample periods are 2002-2004 for foreign banks and 2000-2004 for domestic banks. For Albania, the sample period for foreign banks is: 2000-2004; only one of the five sample banks in Albania for which data were available was domestic. For FYROM, the sample periods are 2000-2004 for domestic banks and 2001-2004 for foreign banks (in 2000 all of the FYROM sample banks were domestic).

Source: Authors' calculations, based on bank balance sheet data (BankScope). CPI data were obtained from the IMF and the central banks of Serbia and Bosnia-Herzegovina (retail sales price index).

Another key issue is whether patterns in bank loan issuance have become more stable over time as foreign banks become more entrenched. Using lending data from individual banks operating in SE Europe, we computed the unweighted and weighted averages of net annual bank loan growth rates (at constant prices). We also computed the standard deviation of the loan growth rates divided by their means. The unweighted numbers reflect averages across banks. Namely, they measure the responsiveness of an average bank regardless of its size. In contrast, the weighted numbers measure differences between larger and smaller banks. They reflect the overall availability of loans from the respective categories of lenders (domestically- and foreign-owned lenders), as

Table 7

Average bank loan growth, 1999-2004

(Annual percentage changes, weighted averages across individual banks)

Year	Bulgaria	Romania	Croatia	Albania	Bosnia-Herzegovina	FYROM	Serbia-Montenegro
A. Domestic banks							
1999	1.2 *(1.5)*	–1.7 *(–1.8)*	–0.2 *(–6.5)*		1.2 *(2.9)*	–	–
2000	0.7 *(2.3)*	–1.6 *(–2.1)*	–0.1 *(–5.1)*		4.2 *(0.6)*	1.6 *(1.3)*	14.3 *(1.7)*
2001	1.6 *(1.0)*	–0.6 *(–2.5)*	0.4 *(1.5)*		1.9 *(1.7)*	1.1 *(2.1)*	–2.9 *(–1.8)*
2002	1.8 *(1.6)*	1.4 *(1.8)*	1.6 *(1.9)*		2.3 *(0.6)*	1.2 *(1.3)*	25.2 *(2.1)*
2003	1.7 *(0.8)*	2.2 *(1.3)*	0.1 *(1.1)*		0.9 *(1.7)*	0.8 *(1.8)*	0.2 *(9.2)*
2004	1.0 *(1.5)*	1.2 *(1.8)*	0.04 *(1.8)*		0.6 *(1.4)*	2.4 *(0.8)*	0.6 *(1.5)*
B. Foreign banks							
1999	1.2 *(1.4)*	–0.1 *(–29.9)*	2.0 *(1.3)*	–	5.6 *(0.4)*	–	–
2000	1.4 *(1.1)*	–1.1 *(–2.7)*	3.2 *(1.4)*	20.9 *(0.3)*	4.2 *(1.9)*	–	–
2001	2.0 *(0.9)*	–0.6 *(–2.5)*	3.2 *(1.2)*	1.2 *(5.3)*	12.2 *(1.7)*	–1.7 *(–3.1)*	–
2002	2.7 *(1.0)*	0.8 *(1.6)*	3.5 *(1.2)*	6.0 *(1.1)*	12.3 *(1.1)*	2.6 *(2.0)*	10.1 *(1.0)*
2003	2.3 *(1.2)*	0.9 *(1.9)*	2.9 *(1.5)*	11.2 *(0.9)*	5.6 *(1.4)*	6.2 *(0.7)*	17.9 *(0.4)*
2004	2.2 *(1.4)*	1.0 *(1.8)*	1.0 *(1.6)*	10.8 *(0.9)*	7.8 *(1.2)*	5.4 *(0.7)*	11.1 *(0.1)*

Note: The coefficient of variation is reported in parentheses. Lending volumes are weighted by bank size, i.e. each bank's share in the total loans of the sample banks. See also note to Table 6.
Source: Authors' calculations based on bank balance sheet data (BankScope).

well as bank size. The results are presented in Tables 6 and 7. The domestically-owned banks exhibit relatively low average growth in loan portfolios and high variability figures, whereas foreign banks generally display higher and less volatile real growth rates in lending volumes. The overall picture does not change, either for foreign-owned banks or their domestically-owned counterparts, when the lending volumes are weighted by bank size (see Table 7), i.e. foreign banks continue to report higher and less volatile real loan growth rates. Furthermore, when comparing the loan growth rates for each bank, one observes that the larger banks have more loan growth than the smaller ones. The larger foreign banks show the highest average loan growth.

Another metric of lending stability controls for whether changes in loan volumes arise because of differing responses to market signals, i.e. whether changing loan volumes might be random and whether or not they are related to macroeco-

Table 8

Bank loan sensitivity to GDP, 1999-2004

(Annual percentage changes)

Countries	Domestic banks	Foreign banks	Number of observations	Bank reaction (Wald test)
A. Unweighted elasticities				
Bulgaria	–6.267*	–0.149	125	Different
	(–2.135)	*(–0.030)*		
Romania	10.578**	–6.488**	114	Different
	(1.512)	*(–1.953)*		
Croatia	5.556*	5.373*	132	Same
	(4.722)	*(3.453)*		
Bosnia-Herzegovina	–2.667**	6.267**	60	Different
	(–1.867)	*(1.715)*		
B. Weighted elasticities				
Bulgaria	–0.199*	–0.355	125	Different
	(–2.480)	*(–1.245)*		
Romania	0.356*	–0.220*	114	Different
	(3.196)	*(–2.030)*		
Croatia	0.183*	0.503*	132	Same
	(2.757)	*(3.645)*		
Bosnia-Herzegovina	–0.507	0.250	60	Same
	(–1.143)	*(1.474)*		

* statistically significant at the 5% level

** statistically significant at the 10% level

Note: T-statistics are reported in parentheses. Ordinary least squares (OLS) regressions over the percentage change in real loans against the percentage change in real GDP. Estimates of bank-specific fixed effects are not reported. Real GDP growth enters in the form of multiplicative dummy variables. The first dummy variable takes a value of 1 in the case of a domestic-owned bank and 0 in other cases. The second dummy variable takes a value of 1 in the presence of a foreign-owned bank. The last column reports the results of a Wald test used to verify whether the difference in the regression coefficients between domestic and foreign banks was statistically significant.

Sources: BankScope and EBRD.

nomic fundamentals in the host country. Using time-series data from individual bank balance sheets, we performed pooled time series regressions for each country to test for differences across domestically- and foreign-owned banks in loan responsiveness with respect to real GDP growth rates. This responsiveness was estimated alternately using unweighted and weighted regressions. The weighted regressions make it possible to measure the total loan responsiveness of a certain group of banks, thus enabling comparisons between larger- and smaller-sized banks. The unweighted regressions, on the other hand, measure the responsiveness of an average bank, regardless of its size. The percentage change in real net total loans (i.e. nominal loans deflated by the CPI) was regressed against the percentage change in real GDP and bank-specific fixed effects. The purpose was to test for statistically significant differences in estimated responses across banks in relation to domestic and foreign ownership on account of cyclical movements in GDP. The results are summarised in Table 8.

In all the countries in the sample (namely, in four of the seven countries in the region for which

there was a satisfactory number of observations), domestic banks were shown to be sensitive to GDP fluctuations. The coefficient of response is statistically significant at the 5% or 10% level. More specifically, total lending in Bulgaria and Bosnia-Herzegovina has been countercyclical, with a rise in real GDP growth by 1.0 percentage point associated with a contraction of 6.0 and 3.0 percentage points respectively in bank lending by the average domestic bank, and with a much smaller contraction in lending by larger banks. In contrast, domestic bank lending in Romania and Croatia tends to be procyclical, driven by the highly procyclical nature of "transaction-based lending".

As far as foreign banks are concerned, we found that Bulgaria had a statistically insignificant coefficient of response, implying that changing lending volumes are rather random and unrelated to macroeconomic fundamentals. In Romania, foreign banks have a counter-cyclical pattern of lending, whereas in Croatia and Bosnia-Herzegovina foreign bank lending has been procyclical. The hypothesis that both foreign and domestic banks have identical lending responses to cyclical forces can be accepted only in the case of Croatia, where domestically- and foreign-owned banks appear to be similarly reliant on sources of funds. Even though both types of banks exhibit credit cyclicality in Romania and Bosnia-Herzegovina, they do not respond similarly to market signals.

Overall, foreign-owned banks appear to present greater, but less volatile, loan growth. However, empirical results suggest that ownership *per se* may not be a strong reason to expect differences in the lending patterns of domestic and foreign banks.

6. Concluding remarks

The purpose of this paper was to study the development of the credit sector in the SEE countries during their transition to a market economy. Particular emphasis was given to the role played by foreign banks in the development of the domestic banking systems. Our main conclusions can be summarised as follows:

First, from the analysis we conducted based on country-aggregated statistical data, we can conclude that the countries of SE Europe present significant differences in terms of banking sector development. Croatia, Bulgaria and Bosnia-Herzegovina have the most developed sectors. Even though the level of financial intermediation is at least four times lower than in the euro area, all the indicators used to measure the level of financial development show a steady long-run upward trend.

Second, foreign banks have a significantly stronger presence than their domestic counterparts in terms of assets and network size.

Third, based on a comparative study of financial indicators compiled using data from bank balance sheets to measure performance and risk, foreign banks were found to perform better in terms of net interest margins, as they face lower fund raising costs. However, being subject to higher overhead costs, they do not ultimately enjoy higher profitability. Nonetheless, the presence of foreign banks appears to have fostered the development of the domestic banking market through cheaper fund raising, greater expenditure on infrastructure and competitive yield offers.

Finally, as regards bank lending patterns, foreign banks generally display higher and less volatile real growth rates in lending volumes. However, our empirical results suggest that ownership *per se* is not a strong reason to expect differences either in lending patterns or in sensitivity to GDP fluctuations between domestic and foreign banks.

Appendix
Data tables

Note: Alpha Bank's branch in Albania is not included in the corresponding table because BankScope, our primary source of statistical bank-level information, does not publish the accounts of all foreign bank branches. Alpha Bank AD Beograd and EFG Eurobank Beograd have been excluded from the sample because their financial statements are not published in accordance with international accounting standards. Vojvodjanska Banka has also been excluded because it had not been part of the sample for the minimum required duration of three consecutive years.
Sources: (for all Appendix tables): Bank balance sheets, national central banks and BankScope.

Table A1. Bulgaria

Bank	Ownership/country of origin	Foreign participation (%)/year of change/name change
1. Bulgarian-American Credit Bank	Foreign/Bulgarian-American Enterprise Fund, USA	69%/1996/no
2. United Bulgarian Bank-UBB	Foreign/National Bank, Greece	89.9%/2000/no
3. UnionBank Commercial Bank AD	Foreign/MKB Bank RT, Hungary	60%/2005/no
4. Société Générale Expressbank	Foreign/Société Générale, France	97.95%/1999/yes
5. Raiffeisenbank (Bulgaria) EAD	Foreign/Raiffeisen International Bank-Holding AG, Austria	100%/1994/no
6. Piraeus Bank Bulgaria AD	Foreign/Piraeus Bank Group, Greece	99.66%/2004/yes
7. Municipal Bank Plc	Domestic	
8. Investbank Bulgaria	Domestic	
9. International Asset Bank AD	Domestic	
10. ING Bank NV	Foreign/ING Bank, Netherlands	100%/1994/no
11. HVB Bank Biochim ad	Foreign/Bank Austria Creditanstalt, member of UniCredit Group	99.79%/2002/yes
12. Hebros Bank	Foreign/Bank Austria Creditanstalt AG	89.92%/2000/no
13. First Investment Bank	Domestic	Joint-stock company
14. Emporiki Bank-Bulgaria EAD	Foreign/Emporiki Bank, Greece	100%/1994/subsidiary
15. DZI Bank AD	Domestic	
16. DSK Bank Plc	Foreign/OTP Bank, Hungary	100%/2003/no
17. Commercial Bank Allianz Bulgaria AD	Foreign/Allianz Holding, Denmark	99.40%/1997/yes
18. Bulgaria Post Bank JSC	Foreign/EFG Eurobank Ergasias SA, Greece	1998 (78.23% ACBH, Cyprus)/2002 (50%) 2004 (99.65)%/no
19. Bulbank AD	Foreign/UniCredit Group, Italy	93%/2000/no
20. Alpha Bank	Foreign/Alpha Bank, Greece	100%/2000/ branch
21. D Commerce Bank AD	Foreign/Isil Dogan & Halit Cingillioglou, Turkey	90%/2002/yes
22. Corporate Commercial Bank AD	Domestic	
23. Nasarchitelna Banka-Encouragement Bank AD	Domestic, state-owned	

Table A2. Romania

Bank	Ownership/country of origin	Foreign participation(%)/year of change/name change
1. Piraeus Bank Romania	Foreign/Piraeus Bank Group, Greece	99.98%/2000/yes
2. Emporiki Bank Romania SA	Foreign/ Emporiki Bank, Greece	100%/1996/subsidiary
3. Banca CR Firenze Romania SA	Foreign/Banca CR Firenze, Italy	56.3%/2006/yes
4. Romanian International Bank SA	Foreign/Roberts Family, USA	89.42%/2002/no
5. UniCredit Romania SA	Foreign/Unicredito Italiano Spa, Italy	99.95%/1997/yes
6. OTP Bank Romania SA	Foreign/OTP Bank, Hungary	100%/1999/yes
7. Sanpaolo IMI Bank Romania SA	Foreign/Sanaolo IMI Group, Italy	98.36%/2002/yes
8. Citibank Romania SA	Foreign/Citigroup INC, Citibank Overseas Investment Corporation, USA	99.6%/1996/no
9. Finansbank (Romania) SA	Foreign/Finansbank, Turkey	56.89%/2000/yes
10. Romanian Savings Bank	Domestic, state-owned	
11. BRD-Groupe Société Générale SA	Foreign/Société Générale, France	58.32%/1998/yes
12. Bancpost SA	Foreign/EGF Eurobank, Greece	77.3%/2002/yes
13. Banca Transilvania SA	Domestic	
14. Banca Tiriac-Commercial Bank Ion Tiriac	Foreign/Bank Austria Creditanstalt, Austria	50%/2005/no
15. Banca Romaneasca SA	Foreign/National Bank, Greece	97.14%/2003/no
16. Romanian Bank for Economic Revival	Domestic	
17. Banca de Credit si Dezvoltare Romexterra SA	Domestic	
18. Romanian Commercial Bank SA	Foreign/Erste Bank, Austria	61.88%/2005/no
19. Banca Comerciala Carpatica SA	Foreign/foreign investors from Italy, Germany and Belgium	1999/no
20. Alpha Bank Romania	Foreign/Alpha Bank, Greece	96.4%/1994/yes
21. ABN Ambro Bank Romania SA	Foreign/ABN Ambro Bank, Netherlands	100%/1995/no

Table A3. Croatia

Bank	Ownership/country of origin	Foreign participation (%)/year of change/name change
1. Jadranska Banka dd	Domestic	Widely-held
2. Zagrebacka Banka dd	Foreign/Unicredito Italiano Spa, Italy	82.16%/2002/no
3. Credo Banka dd Split	Domestic	
4. Centar Banka dd	Domestic	
5. Gospodarsko Kreditna Banka dd Zagreb	Foreign/Veneto Banca SCRL, Italy	72.9%/1993/no
6. Hrvatska Postanska Bank DD	Domestic, state-owned	
7. Istarska Kreditna Bank Umag d.d.	Domestic	
8. Erste & Steiermarkische Bank dd	Foreign/Erste Bank, Austria	51.40%/2002/yes
9. Hypo Alpe-Adria-Bank dd	Foreign/Hypo Alpe-Adria Bank, Austria	100%/subsidiary/yes
10. Karlovacka Banka d.d.	Domestic	
11. Kreditna Banka Zagreb	Domestic	
12. Kvarner Banka dd	Foreign/Adria Consulting SRL, Italy	50%/2000/no
13. Medimurska Banka dd	Foreign/Banca Intersa Spa, Italy	76%/2000/no
14. Nava Banka dd	Domestic	
15. OTP Banka Hrvatska dd	Foreign/OTP Bank, Hungary	100%/2005/yes
16. Partner Banka dd	Domestic	
17. StedBanka d.d.	Domestic	
18. Splitska Banka dd	Foreign/Bank Austria Creditanstalt, Société Générale	99.75%/ 2002 (Bank Austria Creditanstalt)/ 2006 (Société Générale)
19. Slavonska Bank add, Osijek	Foreign/Hypo Group Alpe-Adria, Austria	95.04%/1999/no
20. Slatinska banka dd	Domestic	
21. Raiffeisenbank Austria dd Zagreb	Foreign/Raiffeisenbank, Austria	Subsidiary/1994
22. Privredna Banka Zagreb Group	Foreign/Banca Commerciale Italiana, Italy	66.3%/ 1999/no
23. Podravska Banka	Domestic	

Table A4. Albania

Bank	Ownership/country of origin	Foreign participation(%)/year of change/name change
1. National Commercial Bank-Banka Kombetare Tregtare	Foreign/Calik Seker Consortium, Turkey	60%/October 2000/no
2. Raiffeisenbank, Albania	Foreign/Raiffeisenbank, Austria	100%/2004/yes
3. Banka e Tiranes Sha-Tirana Bank SA	Foreign/Piraeus Bank, Greece	88.7%/1999
4. Banco Italo Albanese	Foreign/Capitalia Spa, Italy, EBRD	60%/1999/no
5. ProCredit Bank (Albania) Sh.A	Foreign/Procredit Holding, KfW, FEFAD, Germany	68.75%/1999/yes

Table A5. FYROM

Bank	Ownership/country of origin	Foreign participation (%)/year of change/name change
1. Alpha Bank AD Skopje	Foreign/Alpha Bank, Greece	100%/2000/yes
2. Tutunska Banka A.D. Skopje	Foreign/NLB DD, Slovenia	78.21%/2000/no
3. Stopanska Banka a.d. Skopje	Foreign/National Bank, Greece	73%/2000/no
4. Ohridska Banka ad Ohrid	Domestic, private	
5. Makedonska Banka za poddrshka na razvojot AD	Domestic, state-owned	
6. Komercijalna Banka A.D. Skopje	Domestic, private (widely-held)	
7. Investbanka A.D.	Domestic	Shareholding company
8. Internacionalna Privatna Banka a.d.	Domestic	
9. Export & Credit Bank Inc-Izvozna I Kreditna Banka AD	Domestic	Joint-stock company
10. Radobank	Domestic	
11. Stopanska Banka Ad, Bitola	Domestic	

Table A6. Bosnia-Herzegovina

Bank	Ownership/country of origin	Foreign participation (%)/year of change/name change
1. Upi Banka dd Sarajevo	Domestic	
2. Union Bank Sarajevo	Domestic, state-owned	
3. Unicredit Zagrebacka Banka BH dd	Foreign/UniCredito Italiano SpA, Italy	Ultimate owner/2000/yes
4. Turkish Ziraat Bank Bosnia	Foreign/T. C. Ziraat Bankasi	68%/1999/no
5. Raiffeisenbank d.d. BH	Foreign/Raiffeisenbank d.d., Austria	96.99%/1992/yes
6. ProCredit Bank (B&H)	Foreign/ProCredit Holding AG, Germany	56.70%/1997/yes

Table A6. Bosnia-Herzegovina *(continued)*

Bank	Ownership/country of origin	Foreign participation (%)/year of change/name change
7. Nova banjalucka banka AD, Banja Luka	Foreign/Bank Austria Creditanstalt AG, Austria	83.27%/2002/yes
8. NLB Tuzlanska Banka d.d.	Foreign/NLB DD, Slovenia	83.64%/1999/yes
9. Hypo Alpe-Adria-Bank a.d., Mostar	Foreign/HypoAlpe-Adria Bank International AG-Hypo Alpe-Adria-Group, Austria	99.99%/2001/no
10. HVB Central Profit Banka dd	Foreign/Bank Austria Creditanstalt AG, Austria	80.85%/2003/yes
11. Gospodarska Banka dd Sarajevo	Domestic	

Table A7. Serbia-Montenegro

Bank	Ownership/country of origin	Foreign participation (%)/year of change/name change
1. ProCredit Bank Serbia	ProCredit Holding (Germany), Kommerzbank (Germany), EBRD (UK), FMO (Netherlands), IFC (USA), KfW (Germany)	16.66% each/2002/yes
2. ProCredit Bank Kosovo	ProCredit Holding (Germany), Kommerzbank (Germany), EBRD (UK), FMO (Netherlands), IFC (USA), KfW (Germany)	16.66% each/ 2000/yes
3. Srpska banka ad	Domestic	
4. Piraeus-Atlas Banka ad Beograd	Foreign, Piraeus Bank, Greece	80%/2005/yes
5. Kulska Banka	Domestic	
6. Komercijalna Banka ad Beograd	Domestic	
7. Erste Bank ad Novi Sad	Domestic	

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Youth participation in the Greek labour market: developments and obstacles*

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1. Introduction and conclusions

Introduction

Every year a number of young people leave education[1] and enter the labour market.[2] Due, however, to the difficulties youths encounter in finding a job, as manifested by *inter alia* the length of time needed for this transition together with the fact that some young people are not economically active, the youth labour force participation rate is low.[3]

The fact that around 21% of individuals who graduated from upper secondary school in 2001, and did not go on to further education,[4] had not been employed until 2006 is indicative of the length of the transition from education to the labour market.[5] The high youth (15-29 years

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1 A description of the education system in Greece, as it stood in 2003, with reference to the points of exit to the labour market is provided in a report of the Education Research Centre (2003).

2 For men over 18 years old it might be better to use the date at which military service has been served as the point of entry into the labour market. Such data are, however, not in general available.

3 According to the 2006 Labour Force Survey (LFS), around 72.7 thousand 15-29 year olds entered the labour market (either in employment or looking for a job). A further 26.5 thousand 15-29 year olds (14.5 thousand men and 12 thousand women) were not economically active despite the fact that they were not studying.

4 It is possible that some of these individuals did proceed to further education in the period 2001-2005 without completing their studies. With the available information we cannot tell what percentage of individuals falls in this category, but, in any case, the figures presented here do not include individuals who were studying in 2005 or 2006.

5 This percentage was 10.7% for men and 32.1% for women. Table A1 in the Appendix presents the percentages of men and women who graduated from upper secondary school in 2000 and, although they did not proceed to further studies, had not yet started working in the years 2003-6. Figures are presented from 2003 onwards to avoid overestimation of the length of the transition due to the obligation of Greek men to serve their military duty.

old) unemployment rate (17.8% in the 2nd quarter in 2006) together with the fact that a significant proportion of the unemployed in this age group have no work experience (57.2% in the 2nd quarter of 2006) is also indicative of the length of the transition from education to the labour market.

Alternatively, as evidence of the difficulty of finding a job, one could refer to *direct* estimates of this length of time, although the available estimates differ significantly depending on the precise definitions followed and the *data* used. OECD estimates for 1996 suggest that in Greece the average number of years that elapse between the minimum age of completion of *compulsory* education (14.5 years old) and the age according to which, on the basis of the LFS, 50% of the population is employed (23 years of age) was 8.5 years. The average estimate for other OECD countries was 7.4 years (OECD, 2000). This estimate, however, does not take into account the point in time in which youth *actually* complete their education. More recent estimates for EU-15 countries by Quintini *et al*. (2007), again on the basis of LFS data, show that in Greece the average length of time between the age in which half of the population of 15-29 year olds complete their education and the age by which half of the population of this age group is working was 37.9 months (3.2 years) in 1997 compared to 28 months (2.3 years) in other EU-15 countries. In 2005, this interval narrowed to 20.5 months (1.7 years) in Greece compared to 25.9 months (2.2 years) in other EU-15 countries.[6]

Young people themselves claim that the main reason for which they cannot find employment is the unavailability of jobs.[7] In other words, they attribute the high youth unemployment rate to the high *overall* unemployment rate. As Chart 1 suggests, the youth unemployment rate is at a much higher *level* than the overall unemployment rate but is in general closely correlated with it, although the gap between the two rates varies over time.[8]

Firms, on the other hand, point to some mismatch between the specific skills in demand and those available. Employers are looking to hire young individuals with communication and team-working skills, familiar with new technologies, with sound knowledge of their subject and the ability to acquire and apply new skills.[9]

A couple of features distinguish younger from older individuals: (a) they have less professional experience, and (b) they exhibit higher job

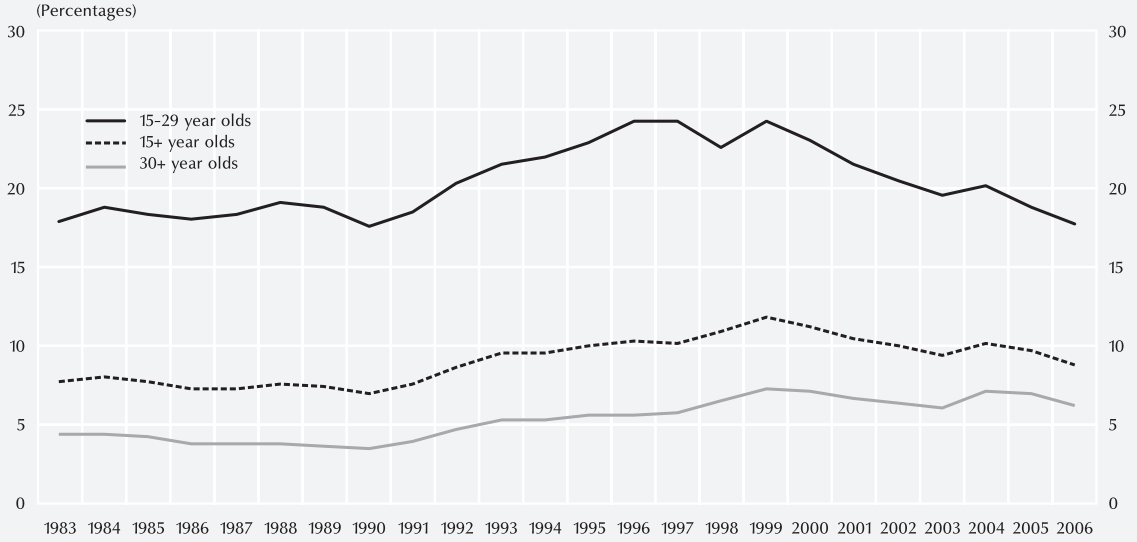
6 Alternative estimates by Quintini *et al*. (2007), using the European Community Household Panel (ECHP), suggest that in Greece in the period 1994-2000 the average length of time to find a job was 21.3 months. The period for finding a job with an *indefinite length* contract, however, was much longer, amounting to 51.5 months. For 11 EU countries (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Portugal, Spain, UK) the average length of time for the transition to a job (a job with an indefinite length contract) was 21.8 months (39.6 months). Excluding Spain, for which the respective figures are exceptionally high, the average length of time for the other 10 countries stood at 20.6 months and 37.9 months, respectively. The authors, however, state that, due to the small size of the ECHP sample, not too much emphasis should be given to the point estimates for individual countries. The *ranking* of countries according to this transition period, however, does provide some useful information.

7 Eurobarometer *Special Survey on Youth 2007* (Gallup Organization, 2007). See Tables A2 and A3 in the Appendix for certain results from the survey.

8 The start of the period is determined by data availability; the unemployment rate series contains breaks prior to 1983.

9 See SEV (2004) for the results of a survey conducted in the second quarter of 2004 with a sample of 374, mostly manufacturing, firms. The results of the survey suggest dissatisfaction of firms with the education system because it does not equip young individuals with the knowledge and skills required. Basic cognitive skills, such as for example following instructions and performing simple calculations, are becoming increasingly important for employee productivity and wage determination (see, *inter alia*, Murnane, Willett and Levy, 1995).

Chart 1
Unemployment rate by age group, 1983-2006 (2nd quarter)
(Percentages)



Source: NSSG, Labour Force Survey.

turnover. The question is whether the education system can make up for these differences.[10]

The present study defines individuals aged between 15-29 as young.[11] The lower limit of 15 years of age is set by the legal employment age,[12] while the upper limit of 29 years was chosen since a high percentage of individuals aged between 25 and 29 years old are still not economically active because they are studying.[13,14] While all individuals in this age group are considered as young in the present study, the group is still not homogeneous; for this reason the evidence presented next is analysed, where possible, further by 5-year age groups (15-19, 20-24 and 25-29 years old). In the rest of the document, and following common practice and the relevant European Council Directive,[15] individuals younger than 15 years old are classified as *children*, while individuals between 15 and 18 years as *teenagers*.

The present study attempts to document and explain developments regarding young persons' labour market and education activities using data

10 Young people, however, are usually more eager to work, and adapt easier to changes in technology. The extent to which these features can compensate for their lower work experience depends on *inter alia* the job, the ability of managers to exploit these advantages and each individual's personality etc.

11 The definition of juveniles is contained in the first article of Law 1837/1989 and the *International Convention for childrens' rights,* ratified by Law 2101/1992.

12 See Law 1837/1989 (Article 2).

13 According to the 2001 Population Census, around 4% of 25-29 year olds were studying. This percentage might have increased since 2001 given that according to the LFS survey in the second quarter of 2006 this stood at 5.5% compared to 4.7% in the 2nd quarter of 2001.

14 Furthermore, many of the measures that have been applied in the context of active and passive labour market policies are addressed to individuals up to 29 years of age (for example unemployment assistance benefit to long-term unemployed 20-29 years old with no previous work experience, special programmes to enhance employability of unemployed young individuals up to 30 years old etc.).

15 See Council Directive 94/33/22.06.1994 on the protection of young people at work, as incorporated into national law through Presidential Decree 62/1998 ("Measures for the protection of young people at work in compliance with Council Directive 94/33").

from mainly 4 sources: (a) Population Census, (b) the Labour Force Survey (LFS), (c) the 2000 Ad Hoc LFS on the "Transition from education to the labour market" and (d) the 1995 and 2002 *Structure of Earnings Surveys*.[16]

More specifically, the study attempts:

First, to investigate how the macroeconomic environment and the industrial composition of economic activity influence the choices of youth regarding their decisions to participate in education and the labour market.

Second, to outline which institutional factors impact on labour demand and supply.

Third, to locate factors (e.g. education level, field of study, labour market conditions etc.) which differentiate the length of time required to find a job among young persons.

Fourth, to document possible recent changes in the relative cost of employing youth.

The remainder of this study is structured as follows: the next section looks at developments regarding youth activities over time in Greece and compares these to developments in the EU-15. The third section investigates the length of the transition from education to the labour market and seeks to identify factors that could explain divergences between individuals as to the length of this transition. The fourth section looks at the determinants of the cost of employing youths, age-earnings profiles and changes in these over time. The last section summarises the findings and suggests issues that need further research.

Conclusions

Analysis of the data suggests that the gap between youth and adult unemployment is not a recent phenomenon in Greece. The youth unemployment rate during the post-1983 period has been on average around 4 times higher than that for individuals over 30 years old. As the unemployment rate for those over 30 increased, the youth unemployment rate reached extremely high levels, around 24%, towards the end of the 1990s. The high youth unemployment rate in Greece does not reflect the frequent movement of individuals between jobs; to the contrary, as is clear from the twin facts of the high unemployment rate and the high share of young unemployed without previous work experience, it is an indication of the prolonged transition period from education to the labour market.

The data suggest two distinctions in the youth population: by *gender* and by *urbanity*; the unemployment rate of young women is significantly higher than that of young men, and the unemployment rate for women is even higher in rural compared to urban areas.

The decrease in the total unemployment rate since the end of the 1990s has been accompanied by an improvement of the relative position of young individuals, perhaps because of the growth of sectors (e.g. retail trade, hotels and restaurants) in which they are primarily employed.

16 Some information on the last two sources is presented in the third and fourth section of the present study and in the Appendix, while a more detailed description can be found at the National Statistical Service of Greece website (www.statistics.gr).

Inspection of the data suggests a long-term increase in the number of students. This is attributable to the expectation of higher wages; the lower probability of unemployment incidence for individuals with higher education level; and the lower opportunity cost of studying during periods of high unemployment.

However, the increased enrolment in education will lead to productivity improvements only if individuals are subsequently employed productively. The paradox is that even in 2006, and despite the significant improvement in the level of youth education[17] and the decrease in the unemployment rate of this age group, this rate is still around three times that of those older than 30, perhaps because the skills and qualifications demanded in the labour market have been upgraded at an even faster rate than the skills supplied. It is indicative that the available wage data suggest that the relative earnings of older individuals rise at an increasing rate compared to the past, indicating that perhaps the labour market attributes more importance to work experience.

Differences between young individuals in the *length* of the transition process are related to, *inter alia,* the degree of urbanisation and the *level* of education. The type of tertiary education institution attended (Universities, Technological Institutes) and the *field* of study also appear to make a difference. In particular, the transition period is shorter for graduates of schools where the content of studies is geared towards labour market participation. Macroeconomic conditions have, as expected, a role in explaining differences over time in the length of the transition process.

Compared to the EU-15, it appears that youth employment rates in Greece are at a lower level, particularly because of the lower employment rate of men and women in the 15-19 age group, and even more so because of the lower employment rate of women in all age subgroups. The low participation rate of 15-19 year olds is not related to the age limit above which employment is allowed, or to the age at which young individuals can leave education, since these limits are stricter in most EU-15 countries compared to the respective limits in Greece.

The higher youth employment rate in the EU-15 is not at the expense of their education, since a very high percentage among them work and study at the same time. In this way they gain work experience, which facilitates their transition from education to the labour market.

2. Youth activities by gender and over time

In 2001 in Greece 48% (35%) of 15-29 year old men (women) were employed, around 32% (35%) were studying, while the remainder (30%) were unemployed or not economically active. These percentages differ substantially between the 5-year age subgroups which make up the group of 15-29 year olds, while they also differ further according to the degree of urbanisation of the area of residence and have changed substan-

17 According to Eurostat (2007), in 2005 the difference between the percentage of 20-24 year olds who had completed upper secondary education and the percentage of 25-64 year olds who had completed upper secondary education was the largest in Greece compared to all other EU-15 countries (Greece: 60.0% of individuals 25-64 years old had completed upper secondary education, 84.1% for individuals 20-24 years old; EU-15 excluding Greece: 67.2% for individuals 25-64 years old, 76.4% for individuals 20-24 years old).

tially over time.[18] Institutional as well as economic and social factors shape participation, employment, unemployment and education enrolment rates. *Institutional factors* include the length of compulsory education, the minimum age for juvenile employment, the existence or otherwise of youth sub-minimum wages, and the recognition of occupational rights. Unemployment benefits are unlikely to deter labour market participation of youth in Greece, as might be the case in other countries e.g. Belgium[19], since significant work experience in the previous two years prior to applying for the benefit is a prerequisite for the payment of the unemployment benefit.[20,21] Macroeconomic performance, the industrial composition of youth employment, and the opportunity cost of not working are among the *economic factors*. *Social factors*, which are however not investigated here, include issues such as the extent of gender discrimination.

Tables 1-4, around which this section evolves, present data which permit the investigation of long-term developments of labour market participation and enrolment in education. Developments reflect the factors mentioned above but also the ageing of individuals. More specifically, Tables 1-4 present (on the basis of the 4 dicennial population censuses in the period 1971-2001) the participation, employment and unemployment rates as well as the education enrolment rates for 8 different cohorts,[22] made up of individuals born in 9 different 5-year periods in the period 1942-86.[23] In the remainder of this study the participation and employment rates are defined as the ratio of the labour force (employed and unemployed) over the population and as the ratio of the employed to the population respectively. The unemployment rate is defined as the ratio of the number of unemployed to the labour force, and finally the education enrolment rate is defined as the proportion of students in the population.

The following main conclusions can be drawn from Tables 1-4:

(a) The *participation rate* increases as individuals *grow older* (see Table 1). This development mainly reflects the completion of studies and family formation, while for women the increased rate also reflects a cohort effect due to a number of reasons such as the equalisation of minimum wages across genders, the growth of the services' sector, in which women are mainly employed etc. Deviations from this trend, as, for example, the decline in the participation rate of men aged 35-39 years old in 1991 from 97.4% in that year to 91.1% a decade later, when these individuals were 45-49 years old, could be a reflection of the specific macroeconomic conditions prevailing at the time.

18 Tables A4-A6 in the Appendix give detailed information on youth participation, employment and unemployment rates (by gender and degree of urbanisation of the area of residence) for the period 1971-2001.

19 See, *inter alia*, OECD, 2007d, for information on the impact of regulations governing the payment of the unemployment benefit on the transition from school to work in Belgium.

20 The monthly benefit of €73.4, which, according to Law 1545/1985, is awarded for 5 months to long-term unemployed aged 20-29 with no previous work experience cannot be thought of as deterring labour supply, due to its low level and the short time period over which it is paid.

21 Being registered as unemployed for a period of over 18 months, however, gives one an edge when applying for a public sector job.

22 The *cohort* here refers to individuals born in the same five-year period. In particular, individuals born in the period 1942-46 constitute one cohort, whose members were aged 25-29 in 1971, those born in the 5-year interval 1947-51 constitute a second cohort, whose members were 20-24 years old in 1971 etc.

23 Karamessini (2006) also investigates the transition from education to the labour market, but defines cohorts on the basis of the year in which individuals complete their studies. This information, however, is only available through the Labour Force Survey (LFS) after 1999 and thus does not permit the study of longer-term trends.

Table 1
Labour market participation rate (%)[1] by cohort,[2] 1971-2001

Men					Women				
Age	Year of birth				Age	Year of birth			
15-19	1952-56	1962-66	1972-76	1982-86	15-19	1952-56	1962-66	1972-76	1982-86
1971	**51.4**				1971	**28.7**			
1981	95.0	**37.7**			1981	37.7	**23.3**		
1991	97.4	94.6	**25.4**		1991	48.4	54.5	**17.4**	
2001	91.1	94.9	90.0	**19.5**	2001	51.5	62.0	67.0	**11.8**
20-24	1947-51	1957-61	1967-71	1977-81	20-24	1947-51	1957-61	1967-71	1977-81
1971	**76.2**				1971	**37.1**			
1981	97.8	**71.5**			1981	33.7	**39.3**		
1991	96.3	97.4	**75.6**		1991	40.8	51.3	**48.8**	
2001	83.6	93.1	94.8	**66.6**	2001	39.8	58.4	64.3	**52.1**
25-29	1942-46	1952-56	1962-66	1972-76	25-29	1942-46	1952-56	1962-66	1972-76
1971	**93.0**				1971	**32.7**			
1981	97.8	**95.0**			1981	31.0	**37.7**		
1991	93.4	97.4	**94.6**		1991	33.3	48.4	**54.5**	
2001	68.5	91.1	94.9	**90.0**	2001	26.0	51.5	62.0	**67.0**

1 The labour market participation rate is defined as the ratio of the labour force (employed and unemployed) over the total population.
2 The participation rate for the age group indicated on the top-left hand side corner is presented in bold in a census year. For example, in 1971 the participation rate of 25-29 year old men was 93.0%, while in 2001 this rate for the same age group (not the same individuals) was 90.0%. The participation rates for each cohort as this grows older are presented in regular fonts; e.g. in 1971, 93.0% of men aged between 25 and 29 years old participated in the labour market, while a decade later the participation rate of these individuals, then aged between 35-39 years old, had increased to 97.8%.
Source: NSSG, Population Censuses, 1971-2001.

In contrast to the increased participation rate that comes about as individuals grow older, the breakdown by age group suggests that the male participation rate within each age group is on a *declining* trend (e.g. the participation rate of men aged 20-24 was 76.2% in 1971, while for the *same* age group the participation rate was just 66.6% in 2001). This change reflects, on the one hand, the increase in the number of students in the same age group (see Table 4), and, on the other hand, the increase in the percentage of men who are not economically active. For women, however, the participation rate in each age subgroup, with the exception of women aged 15 to 19, increased over time despite the increase in the number of students.

Notwithstanding the increased enrolment in education, which no doubt was the most important factor contributing to the decline in the participation of 15-19 year olds, another factor that might have contributed to this decline is the increase in the age limit above which employment is permissible. From 1989 onwards, according to Law 1837/1989, the age limit above which employment is permitted is in general 15 years of age.[24] Until then, in most jobs, employment was permitted above the age of 14, with the exception of certain jobs for which employment of children aged 12-14 was allowed provided the children had completed

24 There are certain jobs, however, in which due to health and safety concerns the minimum age limit is 18 years of age.

primary school (see, Dimitrakopoulos, 1981). Law 1837/1989 also restricts the *number of hours* which school-attending individuals over 15 years can work for; individuals younger than 18 cannot work for more than 6 hours per day and 30 hours per week.[25] The employment of individuals younger than 15 years old is permitted only in family businesses in the primary sector or in non-family businesses related to artistic activities. In any case, for all individuals younger than 18 years of age overtime and night work (between 10:00 pm and 6:00 am) is prohibited.[26] Although the data reported in this study only refer to the population aged 15 years and older, it is possible that the changes in the legislation could have affected those close to 15 years of age.

In Greece, the legal working age is lower than that in most other EU-15 countries, since in most other countries compulsory education has not been completed at this age (see European Foundation for the Improvement of Living and Working Conditions, 2007a).[27] In other countries, children aged 15 are allowed to work only in very specific jobs (e.g. newspaper distribution) or during school vacations. In any case, although legislation is more lax in Greece than in most EU-15 countries, the participation rate of individuals aged 15-19 is lower in Greece (10.2% in Greece, 27.3% in EU-15).

Despite the prevailing legislation, there is still evidence of illegal child work in most countries (ILO, 2002). Even though the quantification of illegal child labour is difficult, there is some *ad hoc* evidence that in the last few years the number of children working illegally has increased both in Greece and in other European countries in which there was a significant inflow of migrants.

(b) For all birth cohorts the *employment prospects* of youth in the labour market improve as they *become older*. Indicatively, the employment rate of men (women) in the 1972-6 birth cohort increased from 19.0% (9.9%) in 1991 (when they were between 15 and 19 yeas old) to 78.2% (56.2%) in 2001 (when the same individuals were between 25 and 29 years old). Similar changes are documented for individuals in all birth cohorts. This improvement reflects the completion of studies and the lower unemployment rate for 25-29 year olds compared to 15-19 year olds.

The male *employment rate* for every age sub-group was on a downward trend during the period 1971-2001. The decline in primary sector activity contributed to this downward trend for 20-29 year olds (see Table A6 in the Appendix, which shows that the decline in the employment rate of 20-24 year olds was much more pronounced in rural areas). Thus, while in 1971 the male employment rate of 20-24 year olds was 71.7%, in 2001 this had declined to 50.2%. On the contrary, the employment rate of 20-24 year old women increased from 34.8% in 1971 to 38.1% in 2001, while the increase for 25-29 year olds was even larger (31.6% in 1971 to 56.2% in 2001).

For the youngest individuals (both men and women), i.e. those aged between 15 and 19, the

25 See Article 2 of Law 1837/1989 "On the protection of youth at work and other provisions".
26 See Presidential Decree 62/1998 "Measures on the protection of youth at work in accordance to European Council Directive 94/33". More specifically, paragraph 6 of article 3 deals with overtime work, while article 8 deals with night work.
27 According to European Council Directive 94/33, Member States "...shall ensure, under the conditions laid down by this Directive, that the minimum working or employment age is not lower than either the minimum age at which compulsory full-time schooling as imposed by national law ends or 15 years in any event."

Table 2
Employment rate (%)[1] by cohort,[2] 1971-2001

Men					Women				
Age	Year of birth				Age	Year of birth			
15-19	1952-56	1962-66	1972-76	1982-86	15-19	1952-56	1962-66	1972-76	1982-86
1971	**48.0**				1971	**26.1**			
1981	89.5	**32.2**			1981	35.6	**18.2**		
1991	94.3	85.7	**19.0**		1991	45.7	46.9	**9.9**	
2001	86.6	88.6	78.2	**11.1**	2001	47.6	56.5	56.2	**6.0**
20-24	1947-51	1957-61	1967-71	1977-81	20-24	1947-51	1957-61	1967-71	1977-81
1971	**71.7**				1971	**34.8**			
1981	95.2	**62.1**			1981	32.7	**33.4**		
1991	93.7	92.7	**61.2**		1991	25.2	39.0	**35.4**	
2001	78.7	88.6	87.0	**50.2**	2001	36.4	53.7	56.9	**38.1**
25-29	1942-46	1952-56	1962-66	1972-76	25-29	1942-46	1952-56	1962-66	1972-76
1971	**90.1**				1971	**31.6**			
1981	95.9	**89.5**			1981	30.4	**35.6**		
1991	90.9	94.3	**85.7**		1991	31.9	45.7	**46.9**	
2001	63.3	86.6	88.6	**78.2**	2001	23.6	47.6	56.5	**56.2**

1 The employment rate is defined as the ratio of the number of individuals employed to the population.
2 See footnote 2 to Table 1.
Source: NSSG, Population Censuses, 1971-2001.

employment rate declined significantly during the period 1971-2001, a development due mainly to the increased enrolment in education, as can be seen from the increase in the unemployment rate (see Table 3)[28] and the change in the percentage of the student population (see Table 4).

In comparison with other EU-15 countries, the employment rate in Greece is significantly lower for 15-24 year old men, while for women the employment rate is lower in all ages, although the gap for women aged 25-29 years old is relatively narrow (see Table 5). Note also that, while the female employment rate is lower than the male employment rate in all EU-15 countries, the gender employment gap is substantially wider in Greece.

28 The decline in the employment rate cannot be attributed to demographic developments (i.e. to an increase in the population of this age group) given that the share of the population aged 15-19 has decreased over time (see Table A10 in the Appendix and Bagavos, 1997). In a number of countries the decline in the employment rate in the 1970s and 1980s was explained through, *inter alia*, the increase in the size of youth population due to the rise in the birth rate following WWII and up to 1965 (see Freeman, 1979). Individuals born in this period who turned 18 in the period 1960-80 entered gradually in the labour market increasing youth labour supply. In Greece, however, there was no similar development. The number of births from the mid-1950s was significantly lower than in the 1930s, while from 1955 and until the end of the 1970s the birth rate did not change much. From the beginning of the 1980s the number of births is declining but this has not *as yet* shown up as a decline in the total number of 15-29 year olds. Two are the main reasons for this development: first, the inflow of immigrants and, second, the gradual entry into the labour market of individuals born in the 1980s. On the basis of data on completed fertility by generation, the youth population will start decreasing because of the decline of the fertility rate below the figure which ensures population replacement (i.e. 2.1 children per woman). As this decrease in the fertility rate is recorded for the generation of women born after the mid-1950s, the decline in the youth population will become evident in the 2011 Census if this is not counterbalanced by immigrant inflow.

Table 3
Unemployment rate (%)[1] by cohort,[2] 1971-2001

Men					Women				
Age	Year of birth				Age	Year of birth			
15-19	1952-56	1962-66	1972-76	1982-86	15-19	1952-56	1962-66	1972-76	1982-86
1971	**6.6**				1971	**9.1**			
1981	5.8	**14.6**			1981	5.6	**21.9**		
1991	3.2	9.4	**25.4**		1991	5.6	13.9	**43.1**	
2001	4.9	6.6	13.1	**42.8**	2001	7.6	8.9	16.2	**48.8**
20-24	1947-51	1957-61	1967-71	1977-81	20-24	1947-51	1957-61	1967-71	1977-81
1971	**5.9**				1971	**6.3**			
1981	2.7	**13.1**			1981	2.9	**15.0**		
1991	2.7	4.9	**18.9**		1991	4.5	7.9	**27.5**	
2001	5.8	4.8	8.2	**24.6**	2001	8.5	8.0	11.5	**26.8**
25-29	1942-46	1952-56	1962-66	1972-76	25-29	1942-46	1952-56	1962-66	1972-76
1971	**3.1**				1971	**3.6**			
1981	1.9	**5.8**			1981	1.8	**5.6**		
1991	2.7	3.2	**9.4**		1991	4.1	5.6	**13.9**	
2001	7.6	4.9	6.6	**13.1**	2001	9.3	7.6	8.9	**16.2**

1 The unemployment rate is defined as the ratio of the number of unemployed to the labour force (employed and unemployed).
2 See footnote 2 to Table 1.
Source: NSSG, Population Censuses, 1971-2001.

(c) Despite the decline in the participation rate of men in the period 1971-2001 as described above, the *unemployment rate*[29] for youth in all age subgroups increased during the period 1971-2001 (see Table 3). The deterioration in this period was even more pronounced for women, for which there was a very significant increase in the participation rate (see Table 1).[30] Recent LFS data give a more encouraging picture showing that in the period since 1999 the unemployment rate is on a declining trend (see Chart 2).

Table 5 suggests that the unemployment rate of youth is higher in Greece than in the EU-15. For 15-19 year olds, however, the size of the gap could be attributed to the small size of the labour force. When the number of unemployed is expressed as a percentage of the population rather than of the labour force, it appears that this ratio is lower in Greece than in the EU-15. Of course the inactivity rate for this age group continues to be much higher in Greece than in the

29 The unemployment definition followed in the Population Census is different to that used in the LFS. More specifically, the 2001 Population Census considers as unemployed those who declare they are looking for a job and have taken some action to this effect, while, according to the LFS, individuals are unemployed if they do not work for even one hour during the reference week, are searching for a job during the 4 weeks prior to the reference week and to this effect take specific actions which they report.

30 For 15-29 year old women, the deterioration was especially large during the period 1981-1991, when the unemployment rate increased by 10.6 percentage points (see Table A4 in the Appendix), while during the period 1991-2001 the decline recorded was only marginal. The unemployment rate for 15-29 year old men increased both during the 1981-1991 and during the 1991-2001 period.

Table 4

Participation rate in education (%)[1] by cohort,[2] 1971-2001

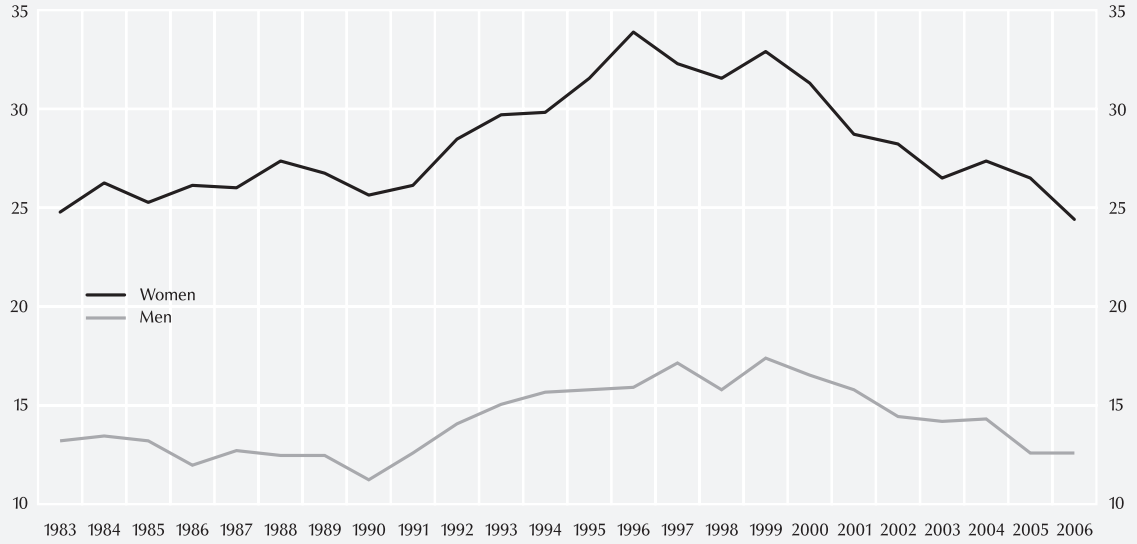
Men					Women				
Age	Year of birth				Age	Year of birth			
15-19	1952-56	1962-66	1972-76	1982-86	15-19	1952-56	1962-66	1972-76	1982-86
1971	**45.1**				1971	**37.4**			
1981	2.6	**58.7**			1981	1.0	**47.9**		
1991	0.1	3.3	**71.9**		1991	0.1	1.9	**66.9**	
2001	0.06	0.4	4.0	**72.5**	2001	0.05	0.3	3.6	**79.8**
20-24	1947-51	1957-61	1967-71	1977-81	20-24	1947-51	1957-61	1967-71	1977-81
1971	**18.6**				1971	**8.1**			
1981	0.3	**19.6**			1981	0.1	**9.8**		
1991	0.0	0.5	**21.8**		1991	0.0	0.3	**19.9**	
2001	0.0	0.1	0.9	**23.7**	2001	0.0	0.1	0.8	**29.1**
25-29	1942-46	1952-56	1962-66	1972-76	25-29	1942-46	1952-56	1962-66	1972-76
1971	**3.5**				1971	**1.2**			
1981	0.1	**2.6**			1981	0.1	**1.0**		
1991	0.0	0.1	**3.3**		1991	0.0	0.1	**1.9**	
2001	0.0	0.06	0.4	**4.0**	2001	0.0	0.05	0.3	**3.6**

1 Defined as the percentage of students in the population.
2 See footnote 2 to Table 1.
Source: NSSG, Population Censuses, 1971-2001.

Chart 2

Unemployment rate of 15-29 year olds by gender, 1983-2006 (2nd quarter)

(Percentages)



Source: NSSG, Labour Force Survey.

Table 5

Employment rate, unemployment rate and percentage of unemployed in the population by gender and age group in Greece and the EU-15 (2nd quarter of 2006)

	Employment rate (percentages)		Unemployment rate (percentages)		Unemployed as a percentage of the population	
	Greece	EU-15	Greece	EU-15	Greece	EU-15
15-19 year olds						
Total	7.0	21.7	32.0	20.7	3.3	5.6
Men	9.4	23.4	26.8	20.4	3.4	6.0
Women	4.6	19.8	40.4	21.0	3.1	5.3
20-24 year olds						
Total	40.5	57.3	23.2	14.0	12.2	9.3
Men	48.5	61.6	15.4	13.7	8.8	9.7
Women	32.1	52.9	32.9	14.4	15.8	8.9
25-29 year olds						
Total	72.9	75.1	13.8	9.7	11.7	8.1
Men	81.9	80.7	9.8	9.3	8.8	8.3
Women	63.2	69.4	19.0	10.2	14.8	7.9
30-54 year olds						
Total	75.8	79.6	6.8	6.2	5.5	5.3
Men	91.6	88.3	4.0	5.5	3.8	5.2
Women	60.1	70.8	10.8	7.1	7.3	5.4

Source: Eurostat, Labour Force Survey.

EU-15 (89.7% in Greece compared to 72.7% in the EU-15).

As expected, the youth unemployment rate is correlated with the overall unemployment rate. In fact, in most countries the youth unemployment rate appears to be especially sensitive to changes in the *overall* unemployment rate. Thus, a change in the overall unemployment rate by, for example, one percentage point, leads to a much larger change in the youth unemployment rate (OECD, 1996). Young individuals are expected to be the first to be affected by a change in the overall unemployment rate because they have less work experience and thus in a slowdown of economic activity are the first to be laid off, while during a boom they constitute a main source of inflow to the labour market. A low responsiveness of the youth unemployment rate to the unemployment rate of those who are older might, however, be due to the discouraged worker effect. Low responsiveness could also be an indication of structural shortcomings (e.g. low youth productivity) which hamper the hiring of young individuals (see, *inter alia*, Clark and Summers, 1990) or specific features relating to the structure of the economy

(e.g. absorption of the macroeconomic shocks through hirings by the public sector).

A first estimate of the responsiveness of the youth unemployment rate to the overall unemployment rate in Greece suggests that during the period 1983-2006 a change of one percentage point in the unemployment rate of individuals older than 30 leads, in general,[31] to a change in the youth unemployment rate by over one percentage point.[32] The correlation is higher in the more recent period (from the mid-1990s onwards), perhaps due to the fact that the decline of the unemployment rate was accompanied by growth of wholesale and retail trade, where youth are predominantly employed, and also due to the increased, in comparison with earlier times, female participation in the labour force. Furthermore, the gradual slowdown of hirings in the public sector, which in the past contributed to insulating the labour market from macroeconomic shocks, resulted in a higher responsiveness of the youth unemployment rate to the macroeconomic environment.[33]

Thus, besides macroeconomic developments, the industrial composition of economic activity also impacts on the employment and unemployment rate of youth, given that young individuals in most countries are concentrated in specific sectors of economic activity. Important differences in the distribution of youth across sectors compared to the distribution of older individuals are an indication of segmentation of the labour market. In most markets youths work predominantly in the trade sector and in hotels and restaurants (OECD, 1996). The sectoral distribution of youth in Greece is similar. The 2001 Population Census data, not presented here in detail, suggest that for men there is higher concentration of youth in the following sectors: *hotels, restaurants, construction and manufacturing.*[34] For women the highest concentration is observed in *activities of a social nature, trade and business activities*. The sectoral distribution of youth employment has changed slightly over time. The most important observed changes were in manufacturing, were the percentage of youth decreased, while the reverse took place in trade. With the exception of manufacturing, however, the sectors in which more young individuals are employed have exhibited higher growth recently. As an indication note that in the period 1991-2001 employment in trade, hotels and restaurants increased at an average annual rate of 2.4%,

31 An exception is the estimate for 20-24 year old women, for which the correlation is lower than one, perhaps because of the significant increase in the percentage of students in this age group.

32 The following specification has been estimated: $u_{jt} = \beta_1 * u_{30t} + \beta_2 * t + \beta_3 * t^2 + \varepsilon_{jt}$ where u_{jt} is the unemployment rate of age subgroup j in year t; u_{30t} is the unemployment rate of individuals older than 30 in year t; t and t^2 are a time-trend and its square, while ε_{jt} is the error term. This specification has been estimated separately for each gender. Estimates using the specification: $\Delta u_{jt} = \alpha + \gamma_1 \Delta u_{30t} + \gamma_2 * t + \eta_{jt}$, where Δu_{jt} is the annual change (in percentage points) of the unemployment rate of age group j, Δu_{30t} is the annual change (in percentage points) of the unemployment rate of individuals over 30 years old and η_{jt} is the residual, have also been performed.

33 In 1983-1994 the elasticity of the youth unemployment rate with respect to the unemployment rate of older individuals is one, being lower than in most other OECD countries. The weaker correlation suggested by the OECD estimates compared to that found in the current study is probably due to the fact that OECD estimates do not discriminate by gender. Note, however, that, even when we discriminate by gender, the correlation before 1994 is weaker than that found for the whole period. In the same OECD study, however, the overall unemployment rate appears to have an impact on the percentage of non-economically active youth.

34 The degree of industrial specialisation (what the OECD, 1996, calls youth employment coefficients) is the ratio of two percentages: the share of young workers' employment by industry over the share of young workers in total employment over the share of older workers' employment by industry over the share of older workers in total employment: $S_i = \frac{(y_i / N_i)/(y/N)}{(o_i / N_i)/(o/N)}$ where y, o, N, i are youths, older workers, total employment and the specific industry respectively. Values of the index (S_i) over one suggest that i is a youth-intensive industry.

although the increase was not uniformly distributed within the decade. More recent LFS and National Accounts data show that this trend has continued past 2001. The importance of the composition of economic activity is also evident from the differences in the unemployment rate by degree of urbanisation. In rural areas, due to the decline in primary sector activity, the unemployment rate is higher, especially for women and marginally for men compared to that in urban areas (see Tables A5 and A6 in the Appendix).

(d) The percentage of *students* in all age subgroups is increasing over time for both genders (see Table 4). This increased demand for education services is reflected in the education level of the population; in 1971 around 41.9% of individuals aged 15-19 were secondary education graduates (29.9% graduates of lower secondary education and 12.0% of upper secondary education), while in 2001 this percentage had increased to around 85.4% (50.8% graduates of lower secondary education, 29.5% of upper secondary education and 5.1% graduates of vocation professional schools). The percentage of those in this age group who had only completed primary education was 50.1% in 1971 compared to 11.8% in 2001.[35] The LFS data, which reflect more short-term developments, show that the increasing trend of participation in education is continuing as exhibited from the decline of 17 year olds who have completed their studies (11.9% in 2001, 6.2% in 2005).[36]

The improvement in educational achievements is also due to the expansion, since the beginning of the 1980s, of the length of compulsory education in Greece from six to nine years.[37] More specifically, from the academic year 1980-81 education is compulsory until the completion of lower secondary school or until 16 years of age. Despite this restriction, however, there is still a number of students, as suggested by the above data and studies of the Pedagogical Institute (e.g. Ministry of Education and Religious Affairs – Pedagogical Institute, 2006), who leave school without completing compulsory education *(school dropouts)*. The percentage of school dropouts from lower secondary school (i.e. the number of students who left school without completing lower secondary school as a percentage of all those registered in the first class of lower secondary school in a specific year) declined from 17.6% for those who registered in the first class of the lower secondary school in the academic year 1982-1983 to 6.1% for those who registered in the first class in the academic year 2000-2001 (see Lariou-Drettaki, 1993, and Ministry of Education and Religious Affairs – Pedagogical Institute, 2006). The school dropout rate is much higher in rural areas compared to urban and semi-urban areas, while the school dropout rate is much higher for boys compared to girls. The typical reason for which children abandon compulsory education is to assist their family, while dropouts are highest among students with low academic achievements. As students who have not completed their studies

35 The rest of the population of this age group had either graduated from post-secondary education (0.1% in 1971, 1.4% in 2001) or had not completed primary school being either literate (6.1% in 1971, 0.6% in 2001) or illiterate (1.8% in 1971, 0.8% in 2001).

36 This (2005) is the last year for which this percentage can be calculated on the basis of LFS data, since in the 2006 and 2007 LFSs there is no question as to whether the interviewee has completed his/her studies.

37 See Law 309/1976 (Article 26, par. 2) and Presidential Decree 739/1980, which provided for the implementation of this law from the 1980-81 academic year. Law 1566/1985, which replaced Law 309/1976, did not alter the length of compulsory education (see Article 2, par. 3), but penalises non-attendance of compulsory education.

themselves declare (see Paleocrassas *et al.*, 1997) and as Population Census data show, the unemployment rate for those individuals is higher than for the population of the same age group.[38] As expected, prematurely leaving school can lead not only to one or more unemployment spells but also to limited career prospects.

Comparisons of dropout rates between countries, usually based on the percentage of 18 to 24 year olds who have not completed lower secondary school, show that, according to Eurostat data, in 2006 this percentage in Greece is 15.9%, similar to that in the EU-15 (17.0%).[39]

Even beyond secondary education it seems that a significant improvement in the level of education has taken place. While in 1971 only 2.3% of 20-24 year olds were university graduates, this percentage has more than doubled by 2001 (5.4%).

The decision of youths to continue their studies after completing upper secondary education is influenced by *inter alia* the expected returns of alternative activities and the macroeconomic environment.

As for the correlation between wages and education level, it should be noted that many sectoral and occupational collective pay agreements determine the levels of minimum wages depending on *inter alia* the education level. Contractual wages of university graduates with no previous work experience employed in industry are around 37% higher than those of Technological Education Institute (TEI) graduates. Increases due to tenure are also steeper for university graduates than for TEI graduates.[40] Firm or individual level agreements introduce further dispersion in wages. A concise picture of differences in wages by education level is presented in Table 6, which shows deviations of monthly and hourly wages for 20-35 year old men by level of education attainment from the wages of high-school graduates. The sample includes full-time men in enterprises with 10 or more individuals in the private sector. By including sector and occupational dummies, these estimates take into account to some extent the differences due to collective agreements.[41] The estimates presented in Table 6 suggest that male TEI graduates employed as service workers in the trade sector receive 11% higher earnings compared to high-school graduates employed in the sector. The estimates confirm the positive correlation between education and earnings, although the returns presented are not necessarily generalisable to the population as a whole, since the data used concern individuals working in large firms (with 10 employees or more), are derived from a limited sample (7,000 individuals) and the estimates presented are not weighted to account for differences in sampling probabilities.

38 The 2001 Population Census shows that the male (female) unemployment rate of 20-24 year olds who have not completed compulsory education was 7.7% (11.6%) compared to 7% (9.3%) for all men (women) of this age group. This reflects the situation in urban areas, while in rural areas the unemployment rate of youth who have not completed their studies is less than the total unemployment rate for this age group.

39 This index belongs to the group of Structural Indicators followed in terms of the Lisbon process and is published at regular intervals.

40 See Arbitration Decision 31/2006.

41 The following specification has been estimated:

$$lny_i = c + \sum_{j=1}^{6}\beta_{1j}S_{ij} + \sum_{h=1}^{9}\beta_{2h}o_{ih} + \sum_{l=1}^{7}\beta_{3l}E_{il} + \varepsilon_i ,$$

where y_i are gross earnings of individual i, S_j are dummies for 6 single digit NACE rev. 1 sectors, o_h are dummies for 9 single-digit occupational groups following the International Standard Classification of Occupations, E_t are the various education levels examined and ε_i is the error term. The constant term, c, represents the average earnings of an individual service worker employed in the trade sector. This specification implicitly makes the simplifying assumption that the education level of individuals, their occupation and the sector in which they are employed are independent of each other.

Table 6

Monthly and hourly earnings[1] by education level: deviations from the earnings of high-school graduates (in percentage points), October 2002[2,3]

Education level	Deviation of total (regular and overtime) gross monthly earnings (in percentage points)	Deviation of gross hourly regular earnings (in percentage points)
Primary school	–8.4	–6.5
Lower secondary school	–4.4	–3.5
Technical and vocational school	–0.5	–1.6
Post-secondary education	7.7	6.9
Technological Education Institutes	11.4	10.6
University education	30.0	29.5

1 Earnings are gross of social security contributions and taxes.
2 The figures in the table represent the coefficients on the education dummies in a regression of gross earnings (monthly or hourly), which also controls for economic activity (at the single-digit level) and for the occupation (at the single-digit level according to the International Standard Classification of Occupations). The reference group is a high-school graduate employed in retail trade in a service-related occupation. Gross monthly earnings for this individual are €806, while gross hourly earnings are €4.8.
3 The results refer to men aged between 20 and 35 who are employed in private sector firms with 10 employees or more in the following sectors of economic activity: Industry (mining, manufacturing), Retail and wholesale trade, Hotels and Restaurants, Transport, Storage and Communications, Financial intermediation and Real estate, Renting and business activities.

Source: Calculations on the basis of the NSSG *Structure of Earnings Survey* for 2002.

Furthermore, differences in tenure, marital status and the size of the firm in which individuals work are not taken into account here.

The magnitude of the increase in the demand for education has differed by gender, as illustrated in Table 4. Furthermore, due to a much larger increase in the number of female students, the percentage of women enrolled in education in 2001 was higher than that for men (e.g. 79.8% for 15-19 year old women compared to 72.5% for men). The higher number of enrolled women is also perhaps due to the expected higher returns for women[42] (see, *inter alia*, Papapetrou, 2007; Magoula and Psacharopoulos, 2004), although expected returns do not take into account the fact that the female unemployment rate is much higher than the male unemployment rate.[43]

Another factor which at every point affects the demand for education services are the macroeconomic conditions and more specifically the probability of finding a job as this is proxied either by the overall unemployment rate or the relative unemployment rate (i.e. the ratio of the youth unemployment rate to the unemployment rate of older individuals). While the correlation between macroeconomic conditions and education enrolment is acknowledged in the literature, the direction of the correlation is not given beforehand. A rise in the unemployment rate could lead to an increase in the demand for education due to

42 Returns to a certain education level are defined as the present value of the net benefits to education in terms of marginal earnings. The net benefits are defined after subtracting from marginal (compared to earnings from the previous education level) expected earnings either the private cost of education (private returns to education) or the cost assumed by the public sector (social returns to education). The private returns to education include not only tuition fees, books etc. but also foregone income.

43 Higher returns to education for women are also observed in other countries. Dougherty (2003) attributes this gender difference to, *inter alia,* the following two facts: (a) that women work in general in sectors in which education is valued more, and (b) that women with higher education achievements possess the productive features required to confront discrimination against them in the labour market.

Table 7

Participation rate % of young adults (15-29 year olds) in education, 2004 (for both genders)[1,2]

	Studying without participating in the labour market[3]			Studying but might also be labour market participants		
	15-19 years old (1)	20-24 years old (2)	25-29 years old (3)	15-19 years old (4)	20-24 years old (5)	25-29 years old (6)
Germany	89.0 (18.5)	37.7 (14.1)	11.7 (2.0)	93.4	44.0	17.6
Italy	81.5 (1.3)	37.6 (4.7)	14.9 (4.3)	82.7	40.7	19.6
France	89.3 (5.9)	37.1 (3.7)	4.6 (0.6)	91.5	45.2	13.3
Greece	83.6 (1.4)	34.3 (2.6)	5.1 (1.8)	84.4	36.7	7.0
Belgium	89.1 (1.5)	34.1 (0.8)	2.9 (0.9)	92.1	38.8	6.0
Ireland	80.0 (11.8)	32.5 (12.7)	8.2 (4.7)	80.6	34.6	12.1
Portugal	72.6 (0.0)	31.7 (0.0)	5.4 (0.0)	74.4	37.8	11.4
Spain	72.2 (0.4)	30.7 (0.5)	6.0 (0.3)	75.9	38.7	11.3
EU-15[4]	73.9 (5.6)	30.7 (3.9)	7.1 (1.4)	84.6	42.3	17.7
Sweden	67.7 (0.0)	28.6 (0.0)	10.8 (0.0)	86.8	42.3	21.0
UK	40.4 (3.5)	24.1 (2.1)	4.4 (0.8)	69.1	36.3	13.2
Austria	78.9 (20.4)	23.2 (2.8)	6.3 (0.5)	83.3	30.3	13.0
Netherlands	42.5 (3.0)	16.6 (2.9)	4.4 (0.9)	89.1	46.1	16.7
Denmark	–	–	–	91.2	61.8	45.4
Finland	–	–	–	90.3	59.6	39.9

1 Countries are presented in decreasing order of the percentage of 20-24 year olds who are studying without participating in the labour market (column 2).
2 OECD data are based on individual countries' Labour Force Surveys.
3 Individuals on apprenticeship schemes are also included; to give an indication of numbers attending such schemes, their percentages in the population are also indicated separately in parentheses.
4 Simple arithmetic average of the EU-15 countries for which figures are presented in the table.
Source: Annual OECD publication *Education at a Glance*, Table C4.2a.

the reduced opportunity cost of alternative activities. On the other hand, however, individuals who would like to study might have to work due to the bad economic situation (Bradley and Nguyan, 2004).

In Greece, there are indications that the correlation between the percentage of students (especially for the age subgroup 20-24) and the ratio of the unemployment rate of this group over the unemployment rate of individuals older than 30 years is positive; an increase in the relative unemployment rate is accompanied by a rise in the percentage of individuals who are students.[44] Furthermore, unemployment rates by education level and field of study have an impact on the field of education followed by young people.

As a result of the increase in the enrolment rate of 15-24 year olds, the student enrolment rate in Greece exceeds that of the EU-15 (see Table 7, columns 1-2).[45] At the same time, however, it

44 Estimates are derived from the following regression: $\Delta s_{jt} = c + \beta_1 \Delta \left(u_j/u_{30}\right)_t + \varepsilon_{jt}$, where Δs_{jt} is the annual change (in percentage points) of the percentage of students of age sub-group j during year t, $\Delta \left(u_j/u_{30}\right)_t$ is the annual change (in percentage points) of the ratio of the unemployment rate of age sub group j (u_{jt}) to the unemployment rate of individuals older than 30 years (u_{30t}), and ε_{jt} is the error term. Estimates are derived from a relatively small sample for the period 1993-2006, since data for the period prior to 1993 are not in general available on a continuous basis. Separate estimates have been produced by gender.

45 Specifically for 15-19 year olds, the percentage of students is higher in Greece than the EU-15 average, although in Greece the length of compulsory education is shorter and individuals can leave school at a younger age. A student could complete compulsory education at the age of 14.5, while in most EU-15 countries (following also the recent prolongation in the UK, Ireland, Spain and Italy), compulsory education lasts for 10 years and the youngest age at which an individual can leave school is 16 years (see European Commission, 2005, and OECD, 2006a).

Table 8

Private and social returns[1] to investment in education in Greece and OECD countries

(Percentages)

	Primary	Secondary	Higher
Private returns			
Greece[2]	–	8.3	8.1
OECD	13.4	11.3	11.6
Social returns			
Greece[2]	–	6.5	5.7
OECD	8.5	9.4	8.5

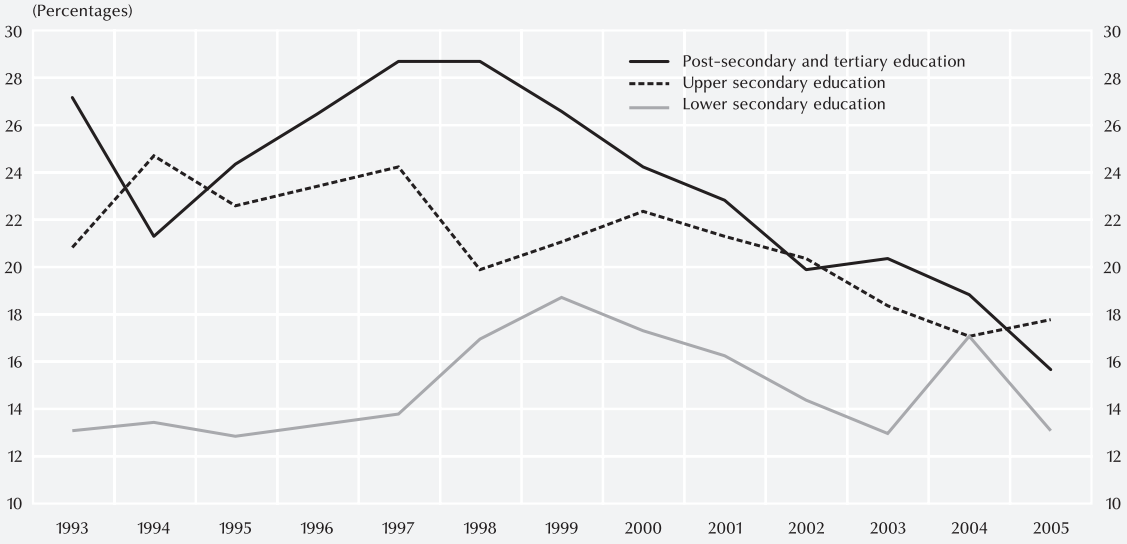
1 Private returns measure the present value of the returns (earnings) from attending an additional level of education (net of the private cost for acquiring this level of education). Social returns differ from private returns because they also take into account state expenditure on education and not only private costs.
2 Estimates for Greece refer to 1993, while the average rate for OECD countries is based on the average of estimates at different points in time.
Source: Psacharopoulos and Patrinos, 2004 (Tables 1 and A1).

seems that among full-time students the percentage of those on dual apprenticeship schemes is lower in Greece compared to the EU-15. Note, for example, that only 1.4% of the population of 15-19 year olds in Greece is registered on dual apprenticeship schemes, while in Germany the corresponding percentage is over 18%. Furthermore, if we take into account those who both study and work (not on dual apprenticeship schemes), then the percentage of students in Greece is around the EU-15 average percentage for 15-19 year olds, while for the 20-24 year olds it is less than the EU-15 average (see Table 7, columns 4 and 5). For 25-29 year old individuals, independently of whether they study and work at the same time or not, the education enrolment rate is around 10 percentage points lower in Greece compared to the EU-15 average (see Table 7, columns 3 and 6).

From the above it appears that the education pattern followed in Greece is that of full-time studies, while in most other EU-15 countries a significant number of students either study and work at the same time or participate in dual apprenticeship schemes. In other words, it appears that the investment in human capital in Greece is not immediately put to work. Dual apprenticeship schemes have been found to improve the employability of individuals and their career path by, for example, avoiding the negative impact (e.g. recurrent unemployment spells, lower earnings) of youth unemployment (see *inter alia* Narendranathan and Elias, 1993; Mroz and Savage, 1999). Firms are also more likely to hire individuals who have gone through an apprenticeship scheme, since this means that the firm does not have to undertake the general training expenditure.

Tables 2 and 3 suggest that employment probabilities improve as people get older. But the employment rates for youths have declined over time in the period 1971-2001 either because of higher student enrolment rates or because of higher unemployment rates. Although in the last few years both the macroeconomic conditions and the composition of economic activity have shifted in favour of youth employability, it is not clear whether this situation is cyclical and might be reversed in the event of a slowdown in economic growth.

Chart 3
Unemployment rate of men aged 20-24 by highest level of education attained, 1993-2005
(Percentages)



Source: NSSG, Labour Force Surveys.

Young people enroll in education to improve their earnings and employment potential and because there is slack in the labour market. The improvement in the education level of youth is significant and on occasions there is talk of overeducation, which is not, however, confirmed either through comparisons with figures for the EU-15 (see Table 7) or from the returns to education estimates, which suggest that the returns to secondary and tertiary education are still positive (see Table 8).

A higher education level is expected to lead to better employment prospects. The unemployment rate of young individuals by level of education does at first sight seem to contradict this expectation (see Chart 3). This interpretation, however, does not take into account the *length of time* that has elapsed from the completion of the highest level of education until finding a job, while furthermore it also does not take into account that earnings expectations are increasing with the level of education completed. So, as presented in Chart 3 for 20-24 year old individuals who have completed upper secondary education, the time that has elapsed since graduation is longer than for university graduates.[46] The length of the transition from education to the labour market is the subject of the next section.

3. The length of the transition from education to the labour market

The previous section presented information on youth participation, employment, unemployment and education enrolment rates. Despite the significant increase in the level of education, as suggested by the increased enrolment rates, finding a job still appears to be a lengthy process in Greece.

46 A similar picture emerges for 25-29 year olds.

Indicatively, in 2006 the long-term unemployment rate among 20-30 year olds was 53.8%, while 64% of these long-term unemployed had no previous work experience.

This section documents systematic differences in the length of the transition process between individuals with dissimilar demographic features (e.g. marital status, nationality etc.) and socio-economic characteristics of the family, under distinct labour market conditions, and having attained different levels of education and followed diverse fields of study.

The framework

Job search theory and *human capital theory* provide a useful framework within which to study the length of the transition from education to the labour market.

According to job search theory, the probability of exiting from an unemployment spell is the product of two probabilities: the probability of receiving a job offer and the probability of accepting this (see *inter alia* Mortensen, 1986; McKenna, 1990, for a presentation of the theoretical framework, and Nickell, 1979; Arulampalam and Stewart, 1995; and Layard *et al.*, 2005, for applications).

In general, the probability of receiving a job offer depends on both *macroeconomic conditions* and on the *skills* of the unemployed. Macroeconomic conditions are in general proxied either by the local unemployment rate or the number of vacancies in the region in which the unemployed is located. Skills, and more generally the productive features of the unemployed, are proxied through their demographic features (age, marital status), their education, their previous work experience etc. The probability of finding a job also depends on the intensity of job search (e.g. search through work agencies, applications to employers etc.).

On the one hand, the probability of accepting a job offer depends on: (a) the wage offered relative to the reservation wage, (b) the cost of searching for a job, (c) income from alternative sources, and (d) the size of the unemployment benefit.

The *reservation wage* is the wage below which the unemployed would not be prepared to work and depends on the person's skills and on the opportunity cost of the time spent searching or working (e.g. child care).[47] A ballpark figure for the reservation wage can be implicitly inferred from the amount of money (both directly and indirectly due to income foregone) that the individual is prepared to spend on his education. The use of this information is consistent with the *human capital theory,* according to which education expenditures are an investment in human capital, and as with investment in physical capital, have a declining marginal return (see, *inter alia*, Becker 1993). The reservation wage is not necessarily time invariant and in fact is probably a negative function of time as the cost of

47 The reservation wage can in some instances be proxied by researchers. In the European Community Household Panel (ECHP) individuals who are looking for a job are also asked for their reservation wage. The LFS, on the other hand, asks only those who declined a job offer for the reason for doing so. The reasons among which the interviewee can choose include the level of earnings offered. In the second quarter of 2006 unemployed 15-29 year olds who declined a job offer (16.0% of the total of the unemployed in this age group), 23.3% (41.6% for men and 15.2% for women) declined this offer because the earnings offered were not satisfactory. Other reasons put forward were: the position did not offer career development prospects (21.3%: 14.3% for men, 24.4% for women), the position did not match the formal qualifications of the interviewee and the hours of work were unsuitable (13.8%: 7.5% for men, 16.6% for women).

being jobless increases over time (since both the psychological cost of having no job —see Winkelmann and Winkelmann, 1998— and the probability that the savings/liquidity constraints become binding rises as time goes by). At the same time, the expectations of the unemployed (or in general of the person seeking work) regarding the probability of finding a job become more realistic as the search process lengthens. The reduction in the reservation wage increases the probability of finding a job. This change does not, however, necessarily imply that the probability of exiting from unemployment increases over time, since this probability is also influenced by other factors already mentioned in earlier sections (e.g. negative stance of employers to long-term unemployed, obsolescence of skills etc. – see, for example, Pissarides, 1992).

Studies on the education-to-work transition in Greece

The relative long length of the transition from education to the labour market has already been noted in other studies. The most recent is that of Karamessini (2006), who looks at the activity patterns of recent (who graduated in 1999) school-leavers for a period of 6 years following their graduation. One of the main conclusions of the study is that the unemployment rate of youth one year after completion of their studies, independently of the level of education achieved, is very high, but this rate decreases with time. Another study on the same issue is that of Kanellopoulos, Mavromaras and Mitrakos (2004). Two are the main differences between the two studies: first, Karamessini aims to document the *developments* regarding the labour market activities (participation rate, employment rate and unemployment rate) in the period 2000-2005 of graduates of one *specific* year (1999). The study of Kanellopoulos *et al.*, on the other hand, looks at the same variables in a single year for those graduating in the two-year period 1996-8. Another difference is that the Kanellopoulos *et al*. study documents in more detail the *level* and *field* of studies completed by individuals. This detailed analysis suggests that the practical training which students attending Technological Education Institutes (TEI) and higher technical and vocational schools have to complete, contributes to a shorter transition period between education and employment. Kanellopoulos *et al*. attribute the prolonged transition period to the fact that the education system is outdated and the curriculum is not in general suitable for the preparation of high-skilled white- collar workers.

The issue of the transition from education, and especially from general and vocational secondary education, to the labour market is also investigated in studies by the Pedagogical Institute. More specifically, a field-study conducted in 1998 through interviews with individuals who graduated in 1989 from upper secondary education and did not continue with further studies shows that technical and vocational education is associated with higher employment probabilities and a lower incidence and duration of unemployment compared to general education.[48] Integrated Comprehensive Lyceum (Eniaio Polykladiko Lykeio)[49] graduates exhibit the longest transition period (2 years), those who attended technical and vocational schools the shortest (1 month), while general education graduates experience unemployment spells

48 Findings from this study are summarised in Paleocrassas, Rousseas and Vretakou (2002).

49 The Eniaio Polykladiko Lykeio, which has now been abolished, aimed to link technical and vocational training with general education.

of length somewhere in the middle (1 year). In the survey year the technical and vocational school graduates exhibit the highest employment rates, although there is a potential composition bias, since most graduates from these schools are men, for which employment rates are, in general, much higher.

Other studies, of a smaller scale, refer to graduates of *specific* tertiary education establishments. One of these studies is that of the Career Services' Office of the Technical University of Crete (Kouikoglou, B. *et al*., 2004), which shows that the transition is very short for electronic and computer engineering graduates.[50]

The results of most of the reported studies do not, however, permit the systematic investigation of the demographic characteristics of graduates, while the results are not comparable because, *inter alia*, the macroeconomic conditions prevailing at the time of each survey were different.

Estimates from a transition model from education to the labour market

The current study attempts a systematic analysis of the factors that can explain differences between young individuals regarding the transition process from school to work using data from the *ad hoc* LFS module on the "Transition from education to the labour market". This *ad hoc* survey was conducted as part of the 2nd quarter LFS of 2000, with a questionnaire, definitions and instructions set by Eurostat. The sample in Greece consists of 7,656 individuals who in 2000 were between 15 and 35 years old and had completed their studies between 1991 and the 2nd quarter of 2000. The information collected for these individuals pertains to the year in which they concluded their studies, the highest level of education achieved, the field of their studies and the year in which they started working.

In the analysis conducted here, a sub-sample of 5,530 individuals were used. This sub-sample includes individuals who in 2000 were (a) labour force members i.e. were working or were looking for work, and (b) were aged between 15 and 30.[51] Comparisons of the unemployment rate for this sub-sample with the corresponding rate for the population of individuals between 15 and 30 years old in the 2nd quarter of 2000 does not show significant differences.[52]

The dependent variable in what follows is the time period which elapsed between the completion of education[53] and the first significant job. *A significant job* is defined as one which started after the individual completed his/her studies and lasted for at least 6 months (i.e. vacation employment does not qualify) with weekly employment of at least 20 hours. Under these definitions, the survey data show that, for individuals who started working

50 Another case of speedy transition was published recently; that of graduates of the Department of Furniture Technology of the Technological Education Institute (TEI) of Larissa. Although the occupational rights of the graduates of this department were established only recently (through Presidential Decree 97/2006 "Establishment of occupational rights of TEI graduates"), the published figures, on the basis of a survey (conducted by the Careers' Office of the Karditsa Annex), show that around 70% of final-year undergraduates of the Furniture Technology Department receive job offers even before completing their studies. The monthly salary offered on average (€850) is around the level of the collectively agreed wage for TEI engineering graduates.

51 More information on this sub-sample and the reasons for which it was selected are provided in the Appendix.

52 According to the 2000 2nd quarter LFS, the unemployment rate of individuals aged 15-30 years was 22.0%, while the corresponding rate for the sub-sample used here, which includes individuals of this age only if they had completed their studies between 1991 and 2002, was 22.9%.

53 This refers to the level of education successfully completed when leaving continuous education for the first time.

after completing their studies, the average transition period between education completion and the start of the first *significant* job is around 31 months for women and 39 months for men. The longer transition period for men is due to the military service men have to complete.[54] It should be emphasised, however, that this particular measurement of the length of the transition process arises under the *specific* definitions used here. Furthermore, some concepts could have been interpreted by interviewees differently than intended; in particular, it is likely that the interviewees regard as significant only a job under an indefinite length contract. It is indicative that a very high percentage (62%) of employees reply that their first significant job is the one they are employed in at the time of the survey, while only 7% declare that they have left from their first significant job, although it is known that youth show high job mobility (see Tables A7-A9 in the Appendix for evidence to support higher job mobility of youth). Since, however, the interest here is in the ranking depending on the length of the transition process and not on the absolute length of the transition process, the assumption is made that the ranking is not affected by these shortcomings. The dependent variable, the length of time from the completion of continuous education until the start of the first significant job, is expressed in months and its distribution is presented in Table A12 of the Appendix.[55] The distribution suggests that there is a wide dispersion in the length of the transition process.[56]

The length of this transition period does not necessarily, however, coincide with a period in which individuals were unemployed, for two reasons: first, because it is possible that these individuals were not actively looking for a job and, second, because men have to serve their military duty. The survey also includes information on the length of any unemployment spell until individuals find a job. This variable is, however, grouped in wide intervals, the last interval is open and has a lower bound of one year, while a very high share of interviewed individuals (over 20%) did not reply to this question.[57] For these reasons, the variable studied here is the time that has elapsed between completion of education and until the start of a job which can be measured more accurately. Separate models are estimated for men and women, since men have to serve their military duty and because potential differences in the reservation wage by gender could lead to differences in the transition process (see, *inter alia*, Bradley and Nguyen, 2004).

The aim of the current work is to document differences between young individuals in the length of the transition process by demographic characteristics, socio-economic features of the family etc., and to identify factors that could speed the transition process and can be influenced by economic and education policies.

The methodology followed in estimating variables that measure the length of time that elapses until a certain event occurs have their origins in medical research and industrial engineering and a brief presentation on the methodology can be found in

54 See NSSG (2003).
55 Note, however, that this analysis does not take into account individuals who are not active in the labour market. The percentage of individuals who are not economically active is high, especially for women, and differs significantly depending on the highest education level attained.
56 A certain number of individuals were still looking for a job when the survey was conducted. These observations are known as incomplete or censored.
57 See Iannelli (2002), p. 55.

Table 9

Estimates of a model for the length of the transition from school to work[1,2]

	Weibull baseline hazard				Semi-parametric Cox model			
	Basic specification		Addition of the father's occupation[3]		Basic specification		Addition of the father's occupation[3]	
	Men (1)	Women (2)	Men (3)	Women (4)	Men (5)	Women (6)	Men (7)	Women (8)
Demographic features								
Marital status	1.15*	1.00	–	–	1.14*	1.0073	–	–
	(0.066)	(0.049)			(0.075)	(0.052)		
Nationality	1.22*	0.82	1.43**	1.15	1.23*	0.79	1.44*	1.16
	(0.10)	(0.10)	(0.20)	(0.26)	(0.11)	(0.10)	(0.22)	(0.27)
Semi-urban areas	1.043	0.95	1.10	1.026	1.028	0.93	1.090	1.013
	(0.060)	(0.073)	(0.070)	(0.097)	(0.067)	(0.076)	(0.076)	(0.10)
Rural areas	1.14**	0.88*	1.16**	0.91	1.13*	0.86*	1.16**	0.90
	(0.054)	(0.053)	(0.059)	(0.062)	(0.061)	(0.055)	(0.066)	(0.064)
Age of education completion (over 18)	1.28**	1.28**	1.24**	1.30**	1.31**	1.30**	1.26**	1.31**
	(0.065)	(0.076)	(0.070)	(0.093)	(0.074)	(0.083)	(0.080)	(0.098)
Socio-economic features of the family								
Father self-employed with personnel	–	–	1.36**	1.52**	–	–	1.40**	1.51**
			(0.096)	(0.14)			(0.11)	(0.14)
Macroeconomic variables								
Annual change in the total unemployment rate (in percentage points)	0.65**	0.73**	0.66**	0.80*	0.58**	0.67**	0.59**	0.75**
	(0.033)	(0.042)	(0.038)	(0.057)	(0.032)	(0.041)	(0.037)	(0.055)
Variables relating to education level and field of study								
Graduate studies	1.57*	2.66**	1.81*	2.44*	1.74**	2.59**	1.99*	2.40*
	(0.30)	(1.029)	(0.48)	(0.92)	(0.35)	(0.98)	(0.55)	(0.90)
Physical education	0.94	1.17	0.96	0.85	0.99	1.19	1.00	0.86
	(0.15)	(0.30)	(0.19)	(0.29)	(0.17)	(0.32)	(0.21)	(0.30)
Teacher education	0.65	1.24	0.52	1.30	0.62	1.28	0.49	1.32
	(0.19)	(0.16)	(0.26)	(0.26)	(0.19)	(0.17)	(0.25)	(0.27)

1 The reference group is that of unmarried high-school graduates of Greek nationality residing in urban areas.

2 These are maximum likelihood estimates and refer to the hazard ratio, which is the exponent of the coefficient estimates. For example, the coefficient estimate on the annual change in the total unemployment rate in the basic specification of the Weibull model is -0.43 [=ln(0.65)]. Standard errors are presented in brackets, while the statistical significance at the 1% and 5% levels is indicated by ** and * respectively.

3 This specification has been estimated only for those individuals residing with their parents or guardians. Since the percentage of married individuals in this sub-sample is very small, this variable has not been used.

4 Agricultural schools, environmental and natural resources studies, physics and mathematics.

5 The hypothesis that α is over 1, and thus that the probability of transition from unemployment into work increases with the duration of unemployment, cannot be rejected.

Table 9 *(continued)*

Estimates of a model for the length of the transition from school to work[1,2]

	Weibull baseline hazard				Semi-parametric Cox model			
	Basic specification		Addition of the father's occupation[3]		Basic specification		Addition of the father's occupation[3]	
	Men (1)	Women (2)	Men (3)	Women (4)	Men (5)	Women (6)	Men (7)	Women (8)
Variables relating to education level and field of study (continued)								
Humanities	0.65*	1.21	0.58*	1.10	0.63*	1.23*	0.57*	1.12
	(0.13)	(0.13)	(0.15)	(0.17)	(0.14)	(0.13)	(0.15)	(0.17)
Social sciences	0.94	1.35	0.95	0.97	1.00	1.36	0.99	0.96
	(0.35)	(0.40)	(0.36)	(0.54)	(0.39)	(0.41)	(0.39)	(0.54)
Business and economics	1.14	1.74**	1.17	2.036**	1.18	1.80**	1.20	2.096**
	(0.15)	(0.22)	(0.17)	(0.31)	(0.17)	(0.24)	(0.19)	(0.32)
Law school	1.22	1.64**	1.20	1.50**	1.41	1.76**	1.36	1.60**
	(0.24)	(0.19)	(0.29)	(0.20)	(0.31)	(0.21)	(0.36)	(0.22)
Medical school	1.73**	2.77**	1.55*	3.82**	1.77**	2.91**	1.52	3.97**
	(0.36)	(0.62)	(0.47)	(0.93)	(0.40)	(0.63)	(0.53)	(0.86)
Life. physical and mathematical sciences[4]	1.0037	1.26	1.12	1.37	1,.043	1.30	1.19	1.40
	(0.13)	(0.22)	(0.16)	(0.31)	(0.15)	(0.24)	(0.18)	(0.33)
Engineering and architecture	1.26*	1.66*	1.29*	2.16**	1.35*	1.73**	1.41*	2.24**
	(0.14)	(0.33)	(0.17)	(0.52)	(0.16)	(0.36)	(0.20)	(0.56)
Technological Education Institutes (TEI)	1.28**	1.27**	1.53**	1.38**	1.37**	1.31**	1.66**	1.43**
	(0.11)	(0.11)	(0.16)	(0.15)	(0.13)	(0.12)	(0.20)	(0.16)
Higher technical and vocational education	1.10	1.31**	1.21*	1.41**	1.11	1.33**	1.24*	1.41**
	(0.076)	(0.087)	(0.096)	(0.11)	(0.087)	(0.093)	(0.11)	(0.12)
Military training school	5.78**	11.62**	4.85**	2.84	5.22**	8.15**	4.66**	2.77
	(2.035)	(7.88)	(1.89)	(2.46)	(1.48)	(4.10)	(1.56)	(2.50)
Secondary technical and vocational school	1.073	1.18*	1.12	1.23*	1.088	1.20*	1.13	1.26*
	(0.058)	(0.10)	(0.068)	(0.12)	(0.068)	(0.11)	(0.078)	(0.13)
Lower secondary school	0.99	0.92	1.027	0.95	0.97	0.91	1.022	0.95
	(0.058)	(0.088)	(0.068)	(0.12)	(0.064)	(0.094)	(0.075)	(0.12)
Primary school	0.77**	0.93	0.78*	0.97	0.73**	0.94	0.74**	0.97
	(0.070)	(0.11)	(0.080)	(0.13)	(0.075)	(0.11)	(0.084)	(0.13)
Likelihood ratio	$\chi^2(22)=252.3$	$\chi^2(22)=249.9$	$\chi^2(22)=202.9$	$\chi^2(22)=200.1$	$\chi^2(22)=301.8$	$\chi^2(22)=273.0$	$\chi^2(22)=239.9$	$\chi^2(22)=216.3$
Number of observations	2.802	2.728	2.286	1.925	2.802	2.728	2.286	1.925
α[5]	1.43 (0.033)	1.13 (0.023)	1.43 (0.038)	1.10 (0.027)	–	–	–	–

1 The reference group is that of unmarried high-school graduates of Greek nationality residing in urban areas.

2 These are maximum likelihood estimates and refer to the hazard ratio, which is the exponent of the coefficient estimates. For example, the coefficient estimate on the annual change in the total unemployment rate in the basic specification of the Weibull model is -0.43 [=ln(0.65)]. Standard errors are presented in brackets, while the statistical significance at the 1% and 5% levels is indicated by ** and * respectively.

3 This specification has been estimated only for those individuals residing with their parents or guardians. Since the percentage of married individuals in this sub-sample is very small, this variable has not been used.

4 Agricultural schools, environmental and natural resources studies, physics and mathematics.

5 The hypothesis that α is over 1, and thus that the probability of transition from unemployment into work increases with the duration of unemployment, cannot be rejected.

the Appendix. These models are usually applied to explain differences between, for example, patients in the length of time that elapses until recovery or death, or the length of time that machines work without a problem. These models are known as *hazard models*[58] and in the case under investigation here the "danger" is the prolongation of the transition period. Estimates from a model in which the baseline hazard follows a Weibull distribution are presented together with estimates from a Cox proportional hazards model. The two sets of estimates do not differ significantly.

The coefficient estimates, or rather their exponents, which show the impact of the explanatory variables on the likelihood of finding a job, are presented in Table 9. Coefficients which take a value greater than unity signify that the likelihood of finding a job increases with the value of the explanatory variable. Descriptive statistics for the variables used in the analysis are presented in the Appendix (Table A13). As already mentioned, in order to deal with a potentially different transition process for men and women, models are estimated for each gender.

Starting from the variables which are related to demographic features we note the following:

(a) The *marital status* of young individuals is here proxied by a dummy to differentiate those who are married. This dummy captures the marital status of the individuals in the year of the survey (2000) and not in the year in which education was completed for which no data are available. Given this shortcoming, any association between the two variables cannot be described as causal. The estimates suggest that for married men the length of the transition is shorter, while for women there appears to be no association. It should be noted, however, that the coefficient on this variable is sensitive to the specification estimated perhaps because in the age group studied here the percentage of married individuals is low (9.1% for men and 22.1% for women, compared to 57.4% and 63.6% respectively in the population of 15-64 year olds).

(b) Another variable often used in similar studies is the *nationality* of individuals (see e.g. Leslie and Drinkwater, 1999). *Ex ante* we would expect that foreign citizenship might be associated with a prolonged transition from school to work, because non-natives have a disadvantage in the use of the Greek language. Estimates from the present study, however, show that male foreign citizens find a job faster than Greeks, perhaps because the reservation wage of the latter group is higher, and because foreign citizens do not have to do military service. For women, on the other hand, nationality does not seem to differentiate the length of the transition. This difference by gender might be linked with gender occupational and sectoral segregation.

(c) The *urbanisation* of the region of residence is expected to impact on the length of the transition. The results suggest that there is a distinction between urban and rural areas with male upper secondary education graduates residing in rural areas finding jobs faster than those in urban areas, whereas the opposite is true for women. The data do not suggest that there is a difference between urban and semi-urban areas.

58 The models are also referred to in the literature as *survival models, transition models* or *failure models*. A detailed presentation of these models and of the methodology followed in their estimation is done by, *inter alia*, Kiefer (1988) and McCullagh and Nelder (1995).

(d) The *age* at which an individual completes his/her studies also appears to have an impact on the length of the transition from school to work.[59] This is captured through a dummy variable which distinguishes between individuals according to whether studies were completed before or after individuals turned 18. As expected, the results suggest that both men and women who are more mature when they complete their studies take less time to find a job.

Socio-economic characteristics of the family can have an impact on the school-to-work transition, since they determine the alternative sources of income of young individuals, their reservation wage and their ability to finance education. The direction of the impact is not, however, known beforehand. On the one hand, individuals from wealthy families can afford to search for a job for longer, while on the other hand their family status might imply better networking in the labour market. The family's socio-economic status is usually proxied with family income, or with parental education. The dataset used here does not have information on parental income, thus the education level of the parent with the highest education level is used as a proxy. In addition, the father's occupation is used and a distinction is made between individuals depending on whether their father follows some kind of entrepreneurial activity (self-employed with personnel). The results suggest that parental education does not have an impact on the length of the transition from school to work, and thus it is not used in the specification estimated here. Entrepreneurial activity on the father's side seems, however, to speed up the transition process.[60]

Labour market conditions

Labour market conditions, proxied here by the annual change in the unemployment rate in the year in which the interviewed individuals completed their studies, seem to have a substantial effect on the length of the transition process. As expected, an increase in the unemployment rate leads to a longer transition process.

Education level and field of studies

Regarding the education level and the field of studies which usually are the focus of attention in transition investigations, we note that compared to high-school graduates, which are the reference group, the high-school and primary-school graduates have a lengthier transition process. Post-graduate studies, on the other hand, shorten the transition process for both men and women, although it should be noted that the number of individuals with post-graduate qualifications is small.[61]

As for the *field of study, t*he following main conclusions could be reached:

(a) For those who completed tertiary education, the *field* of study appears to differentiate the probability of transition more for women than for men. A possible interpretation of this result is that the

59 This variable shows a high correlation with the highest level of education achieved and continues to be statistically significant even when added to specifications that already include variables for the level and field of education.

60 In the specifications presented in columns (3)-(4) and (7)-(8) of Table 9, the number of observations is less than that used in the rest of the specifications, since information on family features is only available when the individual is still residing with his/her parents. Because the percentage of married individuals in this subsample is especially low, the marital status variable is not included in these columns.

61 The percentage of 25-29 year olds with a post-graduate qualification in the economically active population was around 1.8% according to the 2001 Population Census.

deviation of the reservation wage from the market wage is lower for men than for women.

(b) Women graduates of technical and vocational schools at the pre-tertiary education level find a job faster than women high-school graduates (reference group). No statistically significant difference emerges for men. The result for women could be due to the limited number of women graduates from technical and vocational schools.

(c) Men and women graduates of Technological Education Institutes (TEI) find a job faster than individuals in the reference group, a result which appears to be true also for technical and vocational school graduates (IEK) but does not hold for graduates of all tertiary institutes. This result could perhaps be due to the fact that TEI graduates have to complete a period of practical training while they are studying, which could give them an edge since it counts as work experience (see also Kanellopoulos *et al*., who reach a similar conclusion).

(d) Between university graduates (men and women), graduates of technical universities and medical schools find a job faster than high-school graduates. On the other hand, men who have completed university-level humanities studies[62] have a longer period of transition compared to the reference group, perhaps because of occupational segregation. The shorter transition period for women graduates of economics and law schools is noticeable. As for the results which show that for some university school graduates the transition period is longer than for high-school graduates, this could be explained probably from the higher reservation wage of the former individuals, since they need to justify the investment in human capital they have paid for in terms of direct costs and foregone income.

The results of both the Weibull and the Cox models show that the likelihood of finding a job increases as the transition period becomes longer, with the increase being steeper for men than for women.

The distinction of tertiary institutions into those from which the transition period is shorter (TEI, Technical Universities) and the rest, from which the transition process is longer, could be an indication of differences in the efficiency of these institutions and the degree to which students are prepared for the labour market.

The above results, which in general were expected, confirm the view that the way in which teaching is organised and the correspondence between the curriculum and labour market needs can make a difference to the successful transition from education to the labour market.

4. The cost of employing youth

As mentioned in the Introduction, young individuals have two distinctive features: limited work experience and higher job mobility.[63] These fea-

62 *Humanities* include the following fields of study: Theology, Social Theology, Pastoral and Social Theology, Literature, Greek Literature, History, Archaeology, Laography, Philosophy, Psychology, Studies in Philosophy and Sociology, History and Ethnology, Musical Studies, Music Science and Art, Theatre, Methodology of History and Science Theory.

63 Tables A7-A9 in the Appendix provide some indication of labour mobility. Table A7 presents the distribution by age of those who are looking for a job although they are already working. The data suggest that for youth this percentage is higher and cannot be solely attributed to the fact that a high percentage of youth work on fixed-term contracts, since, as Table A8 suggests, a similar picture emerges for those working on indefinite length contracts. The percentage of those who resign their job and do not work is also higher among youth (Table A9).

tures are reflected in lower wages for youth or in limited demand for young employees in case the exogenously determined labour cost has been set at a level higher than their productivity. In other words, the impact of labour cost on labour demand does not depend on the absolute level of wages but on the level of wages relative to productivity. Labour productivity of youth can be affected by *inter alia* the education system and on-the-job training. Data on youth productivity are, however, in general not available. The only observable measure is the labour cost of youth. In Greece the labour cost of youth is to a large extent exogenously determined by institutions and this section refers to these, while age-earnings profiles at two points in time are also presented.

The two most important labour cost elements for businesses are *direct remuneration* and *social security contributions*. Direct remuneration is affected by the *minimum wage levels (*by tenure and marital status) which are negotiated at national, sectoral or occupational level.

Deviations of actual from contractual wages can be agreed in the context of firm-level agreements or individual contracts. Data from the *Structure of Earnings Survey* (SES) show that, among private businesses employing 10 individuals or more, the share of firms with firm-level agreements is small.[64] This seems to be even more so in sectors with a high youth share (trade, hotels and restaurants).

Minimum wages

Some countries provide for sub-minimum wages for youth.[65] In Greece up to June 1989 inclusive, the minimum wage of daily workers younger than 18 years of age was lower than the minimum wage of those over that age. Similar arrangements held for salaried employees younger than 19 years of age. More specifically, the wage for a 15-year old blue-collar worker considered as an apprentice amounted to around 75% of the wage of a 18-year old blue-collar worker, while for 16 and 17-year olds it amounted to between 85% and 95% depending on the number of years of previous work experience.[66] With effect from the end of June 1989, on the basis of Law 1837/1989, individuals younger than 18 are paid, on a *pro rata* basis, depending on the hours of work, with the salary paid to a blue-collar worker or a white-collar employee over 18 with no previous work experience. This regulation does not impact on the subsidies to apprentices which are determined by a ministerial decision.[67]

Both economic theory and applied economic analysis are not clear cut as to the existence or

64 The data are from the 2002 *Structure of Earnings Survey* conducted by the NSSG and show that around 90% of businesses with 10 employees in Industry (manufacturing, mining and quarrying), Wholesale and Retail Trade, Hotels and Restaurants, Transport-Storage-Communication and Financial Intermediaries did not have a firm-level agreement.

65 According to the European Foundation for the Improvement of Living and Working Conditions (2007b), in 2006 a sub-minimum wage for youth existed in five EU-15 countries. These countries and the percentage of the minimum wage to which the sub-minimum wage corresponds are: *Belgium* (20 year-olds: 94%, 19 year-olds: 88%, 18 year-olds: 82%, 17 year-olds: 76%, individuals 16 years old or younger: 70%), *Ireland* (18-year olds in the second year of work: 90%, 18-year olds in the first year of work: 80%, 18-year old apprentices: 75%, younger than 18 years: 70%), *Luxembourg* (17- year olds: 80%, 15- and 16- year olds: 75%), *Netherlands* (22-year olds: 85%, 21-year olds: 72.5%, 20-year olds: 61.5%, 19-year olds: 52.5%, 18-year olds: 45.5%, 17-year olds: 39.5%, 16-year olds: 34.5%, 15-year olds: 30%), and *UK* (18-21 year olds: 83.2%, 16-17 year olds: 61.7%). In *Spain,* the sub-minimum wage for youth (younger than 18), which amounted to 89% of the minimum wage for adults, was abolished in 1998.

66 See, for example, *Labour Legislation Bulletin,* 1989, 45:1091, p. 590 (in Greek).

67 See, for example, Decision 40017/2004 of the Ministers of Finance and of Employment and Social Security as published in Government Gazette 111/B/27.1.2004.

otherwise and the direction of the correlation between the level and the change of the minimum wage and employment (see, *inter alia,* Card and Krueger, 1995 and OECD, 2007b). In order to study the impact of an increase in the minimum wage for the economy *as a whole* there is need for *general equilibrium analysis* (Johnson, 1969). In any case, the negative consequences that could arise from an increase in the minimum wage depend on the level at which this has been set and on the number of employees who are covered by the minimum wage. In Greece, the binding wage for employers is that agreed in the sectoral or occupational collective agreements which set wages that are higher than the minimum wage set by the National General Collective Agreements (NGCA).[68] In general, however, when a change in the wage affects only one group, it is probable that this group will be substituted by another group; this is especially true for groups of unskilled workers (Neumark and Washer, 2006). It is thus likely that the increase in the minimum wage for youth did contribute to reducing employment of this age group. Between 1989 and 1993, the share of 15-19 year olds in total employment decreased (from 2.9% to 2.3%), while the number of unemployed increased by 25%. In the same time period, the share of 20-24 year olds increased (from 8.0% to 8.3%), although the number of unemployed from this age group also increased by 18%. Perhaps the most important consequence of abolishing the sub-minimum wage was that it limited opportunities for youth to gain work experience, which, as indicated in a number of studies (see, *inter alia,* Quintini *et al*., 2007, and OECD, 2007b), is important for their future career path. In any case, however, as already mentioned, what is important for labour demand is not the absolute level of the wage, but whether the marginal productivity condition holds.

Despite abolishing the sub-minimum wage for youth, the institutional framework is such that different minimum wage levels are set according to tenure, while market forces also have an impact on wages. Indeed, abolishing the youth sub-minimum wage, apart from the direct consequence of making 15-17 year olds more expensive than they were before, did give increased value to previous work experience.[69]

The positive association between wage and tenure is based on the marginal productivity condition, since workers improve their human capital as they gain more work experience.[70] Human capital formed by employees is partly the result of *general training,* which is useful in a number of businesses, and partly the result of *specific training* (in other words it is useful only in the firm in which it was obtained).[71] Individuals continue to invest in human capital up to the point at which the present value of their future benefits is higher than the cost of their investment. The cost of the investment includes the cost of education prior to entering the labour market as well as the cost of training

68 Thus, although, for example, the gross salary according to the NGCA for a single individual with no previous work experience was approximately €626 on 1 January 2007, the corresponding figure for receptionists in hotels, a sector in which a lot of young individuals work, was €809.9, while the minimum wage for sales personnel in retail stores was €764.7.

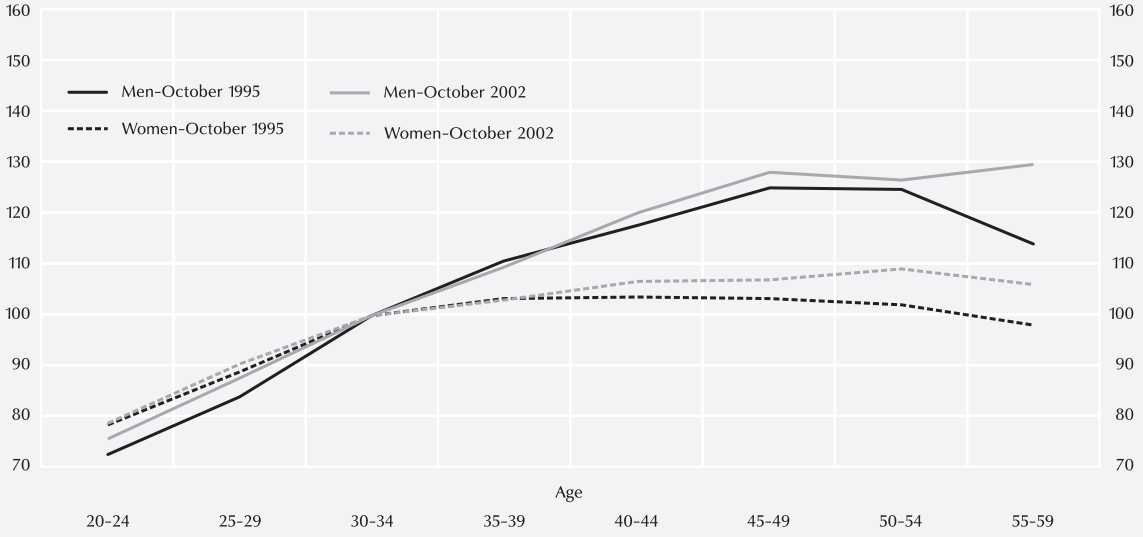
69 While in the past a 18-year old individual with no previous work experience would receive a higher wage than a 17-year old individual with two years of work experience, the abolishment of the minimum wage led to the reverse.

70 The theoretical framework for the analysis of age-earnings profiles was presented by, *inter alia*, Ben-Porath (1967).

71 To this effect the NGCAs provide for work experience to be counted independently of the employer at which it was acquired.

Chart 4

Age earnings profiles: gross monthly earnings of each age group relative to earnings of 30-34 year olds (=100)



Source: Calculations based on the Structure of Earnings Survey data, 1995 and 2002.

while in employment (e.g. obtained through infirm training). The investment in specific training thus depends on the length of time for which the individual and the firm will continue to be partners. As employees approach retirement, the investment in human capital decreases, since they will not manage to reap the benefits from training prior to retiring. Employees increase their productivity at a fast pace at the beginning of their working life, while the rate of productivity improvement slows down until wages reach a peak and then begins to fall.

NGCAs in Greece specify that the minimum wage of white-collar (blue-collar) workers increases due to tenure by 10% (5%) every three years.[72]

In this framework, enterprises decide on wages on the basis of, *inter alia,* productivity of employees and labour demand. The *Structure of Earnings Survey*[73] suggests that, as expected, the age-earnings profile has the shape illustrated in Chart 4. Age is used here due to lack of data on work experience.

Using the 30-34 year olds as a reference group, it turns out that in 2002 the wages of men aged 20-24 years old amounted to 75.9% of the wages of

72 See *Labour Legislation Bulletin* (2004), p. 942. The regulation for salaried employees has been in place since the 1970s, while that for workers on daily pay was enacted in 1977, when an increase was provided for after the first three years. Increases for subsequent three-year periods were gradually introduced (in 1979, 1982, 1996 and 2001). Experience gained at any employer after the age of 19 counts towards total work experience for salaried employees, while for workers paid at a daily rate it is the experience obtained after 18 years of age that counts.

73 Information on the *Structure of Earnings Survey,* which is conducted in all European Union countries under the supervision of Eurostat, are presented in the Appendix. In Greece, the National Statistical Service of Greece (NSSG) conducted two such surveys, in 1995 and 2002, while the 2006 survey is expected to start soon. The survey collects remuneration information in firms which employ 10 people or more in specific sectors of economic activity. An important sector excluded in both 1995 and 2002 was the public sector.

30-34 year olds, and those in the age group 25-29 years old amounted to 87.6% (see Chart 4). Relative wages appear to reach a peak when individuals are between 50 and 54 years old.[74] For women the respective figures were 79% and 90.5% in 2002. In other words, the relative wages of young women are higher reflecting their increased education attainment. After the age of 34, womens' wages improve at a much slower pace compared to mens' wages.[75]

The comparison between 1995 and 2002 illustrates that there are no big differences in the slope and the position of the age-earnings profiles, especially for individuals younger than 34 years.[76] There is, however, a small shift of the curves upwards for the ages over 34 years old, which is more noticeable for women than for men and shows that a higher value is attached to previous work experience. Due, however, to the fact that the changes over time are small and they could perhaps reflect the extra premium attached to the 5th three-year period introduced in 2001, it is not easy to be confident that the estimates indicate a change in the value placed on previous work experience.[77]

Employers' social security contributions

The second most important labour cost element for businesses are social security contributions, which in Greece are high compared to the average in the EU-15. From the beginning of the 1980s and until 1994 employers' contributions increased significantly from 21.75% of the employees' gross wages in the period 1.2.1983-31.12.1987 to around 28% today. At this level, employers' social security contributions are higher than average social security contributions in the EU-15 (which for an employee with average wages were 23%, see OECD 2007e), although cross-country variation is big. The increase of social security contributions can, in general, be shifted at least to some extent onto workers via lower wages. Social security contributions cannot however be shifted onto workers already paid at the minimum wage. For this reason, and in order to enhance the demand for unskilled labour, social security contributions for those paid at the minimum wage are in many countries lower than for the rest of the workers. In EU-15 countries, lower social security contributions for those paid at the minimum wage are paid in Belgium (15.5% compared to 30.4%), in France (17.6% compared to 42.3%), in the UK (6.8% compared to 10.7%) and in Ireland (8.5% compared to 10.8%).[78]

In this spirit, with the aim of enhancing youth employment and complying with the provisions of Laws 2874/2000 and 2972/2001, employers' social security contributions towards the main

74 This decline is observed in both years for women, while for men it is observed only in 1995. This decline does not reflect a decrease in the absolute remuneration of workers but factors such as less overtime hours worked by older workers compared to those of younger workers, as well as the higher education level of younger cohorts. Ideally, the age-earnings profiles should be studied for workers from the *same cohort,* although such data are not in general available for Greece.

75 Data for the relative wages of youth in Greece compared to the relative wages of youth in other European countries (France, Spain, Netherlands), as presented in a recent OECD study (OECD, 2007b), suggest that for both genders the wage of 25-29 year olds compared to the wages of 30-34 year olds is around the same level in Greece as in other European countries, while for 20-24 year olds the relative wage is higher in Greece.

76 A small increase in the relative wages of youth in 2002 compared to 1995 might reflect, *inter alia,* the improvement in the education level of youths.

77 The picture is similar if the analysis is repeated with regular (i.e. not including overtime) hourly earnings to avoid the possibility that any change between 1995 and 2002 reflects the increased overtime premium provided for by Law 2874/2001, since overtime hour patterns differ by age.

78 See OECD (2007e), Table S4.

pension fund were reduced in 2002 by two percentage points (from 13.3% to 11.3%) for those receiving gross wages lower than €600. This rule was in effect until 31.12.2005;[79] since then, however, given that the minimum wage exceeds €600 and this limit has not been adjusted, it is no longer in effect.[80]

It is possible that the increases in employers' social security contribution rates between 1987 and 1994 had a negative impact on the employment of unskilled workers (see tables in the second section above, which clearly illustrate the increase over time in the youth unemployment rate and the decline in the youth employment rate), while the still prevailing high level of social security contribution rates could be negatively affecting the employment of this group. Any reduction in the social security contribution rates goes against the need for fiscal consolidation, and the real issue is whether a reduction in social security contribution rates could be compensated for by an increase in the number of those working and thus liable to pay contributions.

5. Conclusions

The demand by young people for education services has increased significantly in the last few decades, as evidenced by the significant rise in the number of students and the continuously higher levels of education attained. The trend has been stronger for women and, as a result, the percentage of female students in the youth population is now higher than that of male students, and the average number of years of education completed by young women exceeds that of young men. The reasons behind the increased demand for education services can be found in the expected returns and in the prevailing high unemployment rate. The results presented herein suggest that attaining a higher education level can speed up the job search process, but there are significant differences according to the field of studies followed.

The higher level of education attained by young people has not, however, been used to increase the economy's productivity, as witnessed by the low participation rate of youth and their high unemployment rate.

Young individuals possess two distinctive features: (a) they have limited professional experience, and (b) they exhibit higher job mobility. It appears that only certain segments of their education system (Technological Institutes, Technical Universities) can compensate for their shorter professional experience. The relatively worse position of women in the labour market is more difficult to explain on the basis of the data presented. A possible reason for the lower employment rate of women is the reluctance of firms to invest in on-the-job training for women, because family responsibilities might lead them to leave their job. Another potential explanation for the lower employment rate of women is the extensive use of shift work in Greek businesses (possibly as a result of the shortage of capital equipment), which women do not prefer.

79 The last extension, until 31.12.2005, based on the relevant article of Law 2874/2000 was provided for by Ministerial Decision 33364 (Government Gazette 17B/13.01.2004) of the Ministers of Economics and Finance and Employment and Social Security.

80 It is possible that the rule which provided for the exemption of employers from social security contributions in the case of employees *younger than 18* was also aimed at increasing youth employment. This rule was, however, abolished in 1996 (Article 3 of Law 2335/1995).

The limited participation of youth, who constitute a source of innovative ideas and high-level skills, in economic activity is a serious shortcoming for young people themselves, for businesses and for the economy as a whole. If no measures are taken, the negative consequences of the low employment rates of young individuals will become more serious for at least three reasons. *First*, because youths constitute a source from which to expand the labour force in order to lessen the negative impact of demographic developments related to the slowdown in fertility and the increase in life expectancy. *Second*, because youth unemployment can worsen demographic developments since it is associated with lower fertility and, *finally,* because non-participation can lead to the obsolescence of the skills of those in this group, thereby further reducing their chances of finding a job.

Appendix

1. Labour market

1.1 Length of the transition from education to the labour market

Table A1

Percentage of upper secondary school graduates who have not been employed 6 years after their graduation[1]

	2003	2004	2005	2006
Men	28.6	22.6	17.6	10.7
Women	45.6	37.9	35.5	32.1
Total	39.2	30.3	27.3	21.3

1 Percentage of men and women who graduated from upper secondary school in 2000, did not proceed to further education and have not been employed in any of the years since. The figures presented are two-year moving averages.

Source: Calculations on the basis of the Labour Force Survey (LFS).

1.2 Eurobarometer results: Views of youth on the obstacles faced with when looking for a job and on the qualities useful in finding a job

Tables A2 and A3 present some of the results of the Eurobarometer survey on youth conducted in the 27 European Union Member States at the beginning of 2007 in order to document the views of individuals aged between 15 and 30 on, *inter alia*, European integration, their labour market experiences, their participation in political life, and the degree of their financial autonomy.

Table A2
Eurobarometer findings from the youth (15-30 years old) survey: difficulties in finding a job[1]
(Percentages)

Countries[2]	Lack of job opportunities	Lack of practical experience	Unsuitable job orientation at school	Lack of training opportunities	Other reason	No difficulty in finding a job	Don't know/No answer	Total[3]
Portugal	63.3	12.7	6.4	9.5	2.8	4.2	1.2	100.0
Greece	54.0	15.3	14.3	9.3	2.8	3.4	0.9	100.0
Germany	46.3	17.0	7.8	16.4	3.2	6.5	2.8	100.0
Italy	43.1	18.6	13.2	15.5	2.7	5.4	1.5	100.0
Austria	38.9	21.9	6.7	9.5	3.2	15.6	4.3	100.0
Sweden	37.9	32.3	5.7	9.6	4.5	4.3	5.8	100.0
Spain	36.7	26.8	10.5	9.0	4.2	10.7	2.1	100.0
France	35.5	24.0	15.9	10.8	4.5	5.6	3.7	100.0
UK	33.2	27.2	7.9	16.7	3.9	4.1	7.0	100.0
Netherlands	27.1	25.3	7.3	4.3	8.7	23.6	3.7	100.0
Belgium	25.4	22.7	7.3	7.2	5.5	25.8	6.1	100.0
Ireland	24.6	38.2	13.1	11.8	2.7	4.8	4.8	100.0
Luxembourg	19.4	24.2	16.9	10.0	5.3	20.0	4.2	100.0
Finland	19.3	41.9	7.3	5.4	5.9	15.0	5.1	100.0
Denmark	15.8	27.7	8.2	6.3	6.7	30.1	5.1	100.0

1 Percentage of young adults aged 15-30 years looking for a job who mentioned one of the above factors as the most important reason for not being able to find a job.
2 Countries are ranked in decreasing order of the percentage of individuals who mentioned that the lack of job opportunities is an impediment to finding a job.
3 Percentages may not add up to 100.0 due to rounding.
Source: Gallup Organisation (2007), Table 39.

Table A3

Eurobarometer findings from the youth (15-30 years old) survey: useful qualities in finding a job[1]

(Percentages)

Countries[2]	ICT skills	Communication and teamwork skills	Having completed apprenticeship/training course	Entrepreneurial skills	Foreign language skills	Other qualities	Don't know/No answer	Total[3]
Greece	27.0	19.9	17.2	17.1	11.6	6.1	1.1	100.0
Austria	11.0	26.0	25.4	8.2	13.5	13.7	2.3	100.0
Belgium	9.6	24.1	16.7	10.3	22.5	12.9	4.0	100.0
Denmark	14.5	38.1	21.4	9.0	6.9	6.1	4.0	100.0
Finland	14.2	32.7	8.5	8.1	17.7	15.2	3.5	100.0
France	14.0	26.9	28.2	7.0	13.1	9.0	1.9	100.0
Germany	11.3	34.2	27.5	6.0	10.3	9.5	1.1	100.0
Ireland	20.8	32.3	24.1	10.7	4.8	6.9	0.4	100.0
Italy	29.6	17.0	12.2	10.8	25.0	4.2	1.1	100.0
Luxembourg	12.7	18.4	23.4	6.3	23.6	12.2	3.3	100.0
Netherlands	8.8	35.1	19.5	15.2	8.1	12.7	0.6	100.0
Portugal	24.2	14.2	34.1	9.0	11.9	5.5	1.1	100.0
Spain	13.1	24.1	25.7	11.7	14.7	8.5	2.2	100.0
Sweden	14.4	26.1	14.2	7.0	11.0	23.9	3.3	100.0
UK	23.7	31.2	22.9	7.1	6.6	6.3	2.0	100.0

1 Percentage of young adults aged 15-30 looking for a job who identified one of the above factors as the most important quality in finding a job.
2 Countries, except for Greece, are presented in alphabetical order.
3 Percentages may not add up to 100.0 due to rounding.
Source: Gallup Organisation (2007), Table 43.

1.3 Employment, participation and unemployment rate by gender, age and degree of urbanisation (1971-2001)

Table A4

Employment rate, labour market participation rate and unemployment rate by gender and age group, 1971-2001[1]

Age	1971	1981	1991	2001
Total				
Employment rate				
15-19	36.9	25.1	14.3	8.7
20-24	49.9	45.8	47.7	44.4
25-29	59.4	62.1	65.9	67.5
15-24	42.7	34.9	31.4	27.8
15-29	47.7	43.9	42.6	41.8
Labour market participation rate				
15-19	39.9	30.4	21.3	15.8
20-24	53.2	53.2	61.6	59.7
25-29	61.4	65.9	74.1	78.9
15-24	45.8	41.2	41.9	39.3
15-29	50.5	49.4	52.4	53.2
Unemployment rate				
15-19	7.5	17.5	32.9	44.9
20-24	6.1	13.9	22.5	25.5
25-29	3.3	5.7	11.1	14.4
15-24	6.8	15.3	25.1	29.2
15-29	5.5	11.1	18.6	21.5
Men				
Employment rate				
15-19	48.0	32.2	19.0	11.1
20-24	71.7	62.1	61.2	50.2
25-29	90.1	89.5	85.7	78.2
15-24	57.5	45.4	40.4	27.8
15-29	67.5	60.5	55.4	41.8
Labour market participation rate				
15-19	51.4	37.7	25.4	19.5
20-24	76.2	71.5	75.6	66.6
25-29	93.0	95.0	94.6	90.0
15-24	61.4	52.6	50.9	39.3
15-29	71.1	67.2	65.3	53.2
Unemployment rate				
15-19	6.6	14.6	25.4	42.8
20-24	5.9	13.1	18.9	24.6
25-29	3.1	5.8	9.4	13.1
15-24	6.3	13.7	20.5	28.3
15-29	5.0	9.8	15.2	20.4
Women				
Employment rate				
15-19	26.1	18.2	9.9	6.0
20-24	34.8	33.4	35.4	38.1
25-29	31.6	35.6	46.9	56.2
15-24	30.7	25.8	23.0	23.2
15-29	30.3	29.0	30.7	34.9
Labour market participation rate				
15-19	28.7	23.3	17.4	11.8
20-24	37.1	39.3	48.8	52.1
25-29	32.7	37.7	54.5	67.0
15-24	32.8	31.3	33.5	33.3
15-29	32.8	33.4	40.3	45.3
Unemployment rate				
15-19	9.1	21.9	43.1	48.8
20-24	6.3	15.0	27.5	26.8
25-29	3.6	5.6	13.9	16.2
15-24	6.4	17.6	31.4	30.5
15-29	7.6	13.2	23.8	23.0

1 Calculations have been performed on the basis of *actual population* figures. According to NSSG census definitions, *actual population* refers to those who for whatever reason on the census day were resident in the country either on a permanent basis or on a short-term visit.

Source: NSSG, Population Censuses 1971-2001.

Table A5

Employment rate, labour market participation rate and unemployment rate by gender and age group in urban areas, 1971-2001[1,2]

(Percentages)

	1971	1981	1991	2001
Total				
Employment rate				
15-19	32.5	21.8	12.3	8.2
20-24	47.2	44.2	46.6	43.7
25-29	57.5	61.5	66.5	68.4
15-24	39.4	32.8	30.0	27.3
15-29	44.8	42.5	41.9	41.8
Labour market participation rate				
15-19	35.2	26.9	19.0	14.8
20-24	50.5	51.6	60.3	58.2
25-29	59.6	65.4	75.2	79.7
15-24	42.4	39.0	40.3	38.1
15-29	47.6	47.9	51.7	52.8
Unemployment rate				
15-19	7.7	19.0	35.2	44.3
20-24	6.5	14.4	22.8	24.9
25-29	3.6	6.1	11.5	14.2
15-24	7.1	16.0	25.6	28.4
15-29	5.7	11.4	18.9	20.8
Men				
Employment rate				
15-19	42.5	27.0	15.3	10.2
20-24	66.5	58.0	57.3	48.5
25-29	88.5	88.6	84.8	78.3
15-24	52.7	41.0	36.7	30.7
15-29	63.8	57.6	52.4	47.3
Labour market participation rate				
15-19	45.5	31.9	21.2	17.9
20-24	71.1	67.1	71.0	64.1
25-29	91.6	94.4	93.8	89.9
15-24	56.3	47.8	46.5	42.6
15-29	67.2	64.1	62.0	59.1
Unemployment rate				
15-19	6.6	15.4	27.8	42.8
20-24	6.4	13.6	19.3	24.3
25-29	3.4	6.1	9.6	13.0
15-24	6.5	14.2	21.2	27.9
15-29	5.2	10.1	15.4	20.0
Women				
Employment rate				
15-19	22.4	16.8	9.6	6.1
20-24	33.2	34.1	37.2	38.7
25-29	28.8	36.3	50.0	58.4
15-24	27.8	25.8	24.0	23.7
15-29	28.1	29.3	32.5	36.1
Labour market participation rate				
15-19	24.8	22.1	17.0	11.5
20-24	35.6	40.3	50.9	52.1
25-29	30.1	38.7	58.3	69.3
15-24	30.3	31.6	34.8	33.4
15-29	30.2	33.9	42.4	46.2
Unemployment rate				
15-19	9.9	24.0	43.7	46.7
20-24	6.8	15.3	27.0	25.6
25-29	4.1	6.1	14.1	15.8
15-24	8.1	18.2	30.9	29.0
15-29	6.9	13.7	23.4	21.9

1 Calculations based on figures for actual population, for the definition of which see footnote 1 in Table A4.
2 Including semi-urban areas.
Source: NSSG, Population Censuses 1971-2001.

Table A6

Employment rate, labour market participation rate and unemployment rate by gender and age group in rural areas, 1971-2001[1]

(Percentages)

	1971	1981	1991	2001
Total				
Employment rate				
15-19	46.1	33.3	19.9	10.2
20-24	57.5	50.9	51.5	46.7
25-29	64.3	64.1	63.9	64.6
15-24	50.7	40.9	35.5	29.3
15-29	54.6	48.0	44.7	41.7
Labour market participation rate				
15-19	49.7	39.1	27.8	19.0
20-24	60.5	58.3	65.7	64.4
25-29	66.0	67.1	70.9	76.2
15-24	54.0	47.4	46.5	42.8
15-29	57.5	53.4	54.4	54.5
Unemployment rate				
15-19	7.1	14.9	28.4	46.6
20-24	5.1	12.7	21.7	27.4
25-29	2.6	4.5	9.9	15.2
15-24	6.2	13.7	23.7	31.5
15-29	5.0	10.2	17.8	23.5
Men				
Employment rate				
15-19	60.3	45.0	29.4	13.8
20-24	87.0	73.8	72.6	55.4
25-29	94.0	92.2	88.2	77.9
15-24	69.7	57.0	51.2	35.8
15-29	77.1	68.4	63.8	50.5
Labour market participation rate				
15-19	64.5	52.1	37.5	24.3
20-24	91.6	84.0	88.8	74.0
25-29	96.4	96.8	96.6	90.2
15-24	74.0	65.3	63.4	50.6
15-29	80.8	75.6	74.7	64.4
Unemployment rate				
15-19	6.6	13.5	21.6	42.9
20-24	4.9	12.2	18.2	25.2
25-29	2.5	4.8	8.8	13.6
15-24	5.9	12.8	19.2	29.2
15-29	4.7	9.5	14.6	21.6
Women				
Employment rate				
15-19	33.4	21.7	10.9	5.7
20-24	38.9	31.1	29.3	35.7
25-29	38.2	33.1	36.3	48.3
15-24	35.8	25.9	19.7	21.3
15-29	36.5	28.0	24.9	30.8
Labour market participation rate				
15-19	36.3	26.3	18.6	12.7
20-24	41.1	36.0	41.5	52.1
25-29	39.3	34.3	41.6	59.0
15-24	38.4	30.6	29.6	33.1
15-29	38.6	31.7	33.3	42.2
Unemployment rate				
15-19	8.0	17.6	41.3	55.0
20-24	5.2	13.6	29.4	31.4
25-29	2.7	3.5	12.8	18.2
15-24	6.7	15.5	33.3	35.7
15-29	5.6	11.8	25.4	27.1

1 Calculations based on figures for actual population, for the definition of which see footnote 1 in Table A4.
Source: NSSG, Population Censuses 1971-2001.

1.4 Job mobility by age group

Table A7

Percentage of individuals looking for a job while they are working, 2nd quarter 2006[1]

Age	Total	Men	Women
15-19	8.7	6.6	13.0
20-24	8.0	6.0	11.1
25-29	6.0	5.6	6.6
30-34	3.9	3.8	3.9
35-39	2.4	1.8	3.3
40-44	2.0	1.0	3.5
45-49	1.2	0.9	1.6
50-54	1.0	0.7	1.4
55-59	1.3	1.2	1.6
60-64	0.4	0.6	0.1

1 Percentage of individuals who are both working during the survey reference week and have been looking for a job during the 4 weeks preceding the survey. From the available information it is not possible to exclude the individuals looking for a second job and not for a new job.
Source: NSSG, LFS.

Table A8

Percentage of individuals looking for a job while working on an indefinite length contract, 2nd quarter 2006[1]

Age	Total	Men	Women
15-19	6.0	2.1	13.8
20-24	3.4	2.1	5.4
25-29	3.0	2.6	3.5
30-34	2.3	2.8	1.6
35-39	1.2	1.1	1.2
40-44	1.0	0.4	2.0
45-49	0.5	0.1	1.0
50-54	0.6	0.4	1.0
55-59	0.8	0.3	2.0
60-64	0.0	0.0	0.0

1 Percentage of individuals who are both working during the survey reference week and have been looking for a job during the 4 weeks preceding the survey. From the available information it is not possible to exclude the individuals looking for a second job and not for a new job.
Source: NSSG, LFS.

Table A9

Percentage of individuals who are not working having quit from their previous job, 2nd quarter 2006[1]

Age	Total	Men	Women
15-19	7.8	12.7	2.1
20-24	17.7	14.1	20.6
25-29	21.4	10.9	26.9
30-34	22.3	6.0	27.6
35-39	19.9	1.8	27.0
40-44	11.0	5.7	14.0
45-49	5.6	2.4	7.3
50-54	7.6	3.6	11.2
55-59	1.9	0.9	3.5
60-64	1.1	0.3	2.5

1 Individuals who declared that they quit their job for personal or other reasons (not however because they are taking care of other family members, young or old) as a percentage of all individuals who stopped working for whatever reason.

Source: NSSG, LFS.

2. Demographic developments

Table A10
Percentage of youth in the population,[1] 1971-2001

Age	1971	1981	1991	2001
Total				
15-29	18.8	20.2	21.2	22.0
15-19	7.3	7.1	7.0	6.6
20-24	5.9	6.4	7.3	7.6
25-29	5.6	6.7	6.9	7.8
Men				
15-29	17.7	19.5	20.8	23.2
15-19	7.3	7.1	6.9	7.0
20-24	4.9	5.6	7.1	8.1
25-29	5.5	6.7	6.9	8.1
Women				
15-29	19.7	20.9	21.6	20.9
15-19	7.2	7.1	7.1	6.3
20-24	6.8	7.1	7.5	7.2
25-29	5.7	6.7	7.0	7.4

1 Refers to actual population (the definition of which is presented in the footnote to Table A4).
Source: NSSG, Population Censuses 1971-2001.

3. Education statistics

Table A11
Number of registered students in comprehensive and vocational upper secondary schools in the period 2001-2006[1]

School years	Comprehensive schools	Technical vocational schools[2]
2001-2002	230,165	160,451
2002-2003	228,747	153,311
2003-2004	233,723	145,020
2004-2005	238,984	134,623
2005-2006	235,528	122,500

1 Figures for school years 2001-2 to 2004-5 refer to the number of students at the end of the school year. Figures for 2005-6 refer to the number of students at the start of the school year.
2 Students registered at technical vocational schools of the Manpower Employment Organisation (OAED) are included in these figures.
Source: NSSG, Education Statistics.

4. Brief description of two of the surveys used in the analysis

4.1 NSSG survey on the transition from education to the labour market

Following Commission Regulation 1925/1999 certain questions pertaining to the transition from education to the labour market were added to the LFS questionnaire used in the survey for the second quarter of 2000.

The sample for the LFS is derived from a two-stage (area, household) stratified sampling procedure based on the 1991 Population Census. The LFS sample size in the second quarter of 2000 was 53,669 individuals 15-64 years old. The supplementary questionnaire was answered by a subset of 7,656 individuals aged 15-35, who had either completed their studies between 1991-2000 or, if they were studying when the survey was conducted, had some labour market experience having interrupted their studies for a period longer than a year.

The information gathered through the survey includes: (a) The date (month and year) of leaving basic continuous education, defined as that which starts from primary education and continues without a break,[1] (b) the highest level of education successfully completed and the school and department at which this was completed, (c) the date (month and year) in which the individual started working in his/her first significant job (the first significant job is defined as the job which started after leaving basic continuous education, had a duration of at least 6 months and the weekly hours of work were at least 20), (d) the occupation of the individual in his/her first significant job, and (e) parental education level.

The analysis in this paper uses only the sub-sample of individuals younger than 30 years. The reason is that individuals 31-35 years old in 2000 would have completed their education in the period 1983-87 and thus only a few would be still studying in the period 1991-2000.

The NSSG noted the following shortcomings in conducting the survey:[2]

(i) The absence of a link between the main survey and the *ad hoc* module, which meant that interviewers had to revisit the answers provided in the main questionnaire to check for consistency.

(ii) The pen and pencil recording of answers during the interview, and the conduct of quite a few interviews by telephone.

(iii) The differences between the questionnaire of the *ad hoc* module and the main LFS questionnaire in the definition of a first significant job.

4.2 NSSG survey on the structure and distribution of earnings in firms

This sample survey is conducted in most European Union Member States through the use of a harmonised questionnaire. The survey was conducted for the first time in 1995 (following Council Regulation 2744/1995) and was repeated in 2002 (according to Council Regulation 530/199), while from 2002 onwards it is to be conducted at regular 4-year intervals. In Greece the survey was designed and conducted by the Employment Statistics Section of the Division of Population and Labour Market Statistics of the NSSG.

The aim of the survey is to collect data on the level and the structure of labour costs at the individual firm level.

1 Interruptions of less than one year are included in this definition.
2 Details can be found in the quality report by Iannelli (2002).

The sample selection is done through stratified sampling, where the primary sampling unit is the establishment belonging to a firm with average annual employment of at least 10 individuals. The sample is selected from the NSSG registry of businesses stratified by region, economic activity (two-digit sectoral classification on the basis of NACE, rev. 1) and the size of the firm as defined by average annual employment.

The data collected include the following information on the firm's side: sector of economic activity, total number of employees, type of collective agreement followed (e.g. company, sectoral, national etc.) and the type of financial control of the company (e.g. state-owned. The information collected at the level of the individual employee includes the type of contract the employee is on (e.g. indefinite length etc.), the hours of work (regular and overtime), the number of annual days of leave, annual and monthly earnings and the structure thereof (e.g. regular, bonuses, overtime etc.).

Both the 1995 and the 2002 surveys include firms from the following one-digit NACE, rev. 1, sectors: Mining and Quarrying (C); Manufacturing (D); Electricity, Gas and Water Supply (E); Wholesale, retail trade and car repair (G); Hotels and Restaurants (H); Transport, Storage and Communication (I); Financial Intermediation (J). The 2002 survey in addition includes firms from the following sectors: Construction (F); Real Estate, renting and business activities (K). Sectors F and K have, however, been excluded in the analysis performed in the present study when comparisons are being performed between the two years.

The size of the sample in 1995 was 3,585 firms and 52,975 employees, while for the 2002 survey the sample size was 2,907 firms and 48,763 employees. Further information on this survey can be found at NSSG website (www.statistics.gr).

5. Estimating transition models

The estimation methods used for modelling variables measuring the time elapsed until a certain event occurs have their origins in the area of medical research and industrial engineering. In these sciences such models are used to test, for example, the impact of drugs on the probability of survival or differences in the time of uninterrupted operation of machines. These models are known as hazard models. In the issue investigated here, the "danger" is the prolongation of the period of transition from education to the labour market. An idiosyncratic feature of these models which complicates their estimation is that observed durations are often censored in that they do not reflect the full record of the patient, the unemployed or the machine, given that at the time of recording the phenomenon under investigation is still in progress. Observations are thus classified as uncensored (complete) or censored (incomplete). Observations for which the complete length of the unemployment spell is known are uncensored. Observations, however, for those that are still unemployed at time t and for which the total length of time over which they will be looking for a job is unknown are censored.

Survival models are characterised by three related functions: (a) *the distribution function* $F_t = \Pr(T<t)$, which depicts the probability that the random variable T (e.g. transition from education to the labour market) takes a value less than t (i.e. shows the percentage of individuals who have found a job by point t) (b) *the survivor function* $S_t = 1 - F_t = \Pr(T \geq t)$, which shows the probability that the random variable T takes a value equal to or greater than t (e.g. shows the probability that the length of the transition period exceeds t) and (c) the *hazard function* (h_t), defined as the ratio of the density function f_t[3] over the survivor

3 Where $f_t = dF_t/d_t$.

function S_t i.e. $h_t = f_t / S_t$. This function shows the probability of transition from one state to another (e.g. finding a job, death, machine breakdown) given the time that the person (or the machine) has already spent in the initial state (e.g. looking for a job, receiving treatment etc.). For the issue under investigation, the hazard function h_t shows the probability of exiting from unemployment (or alternatively of finding a job if we assume that there are only two states). This function usually depends on the length of time (t) the individual has spent as unemployed as well as on other factors, some of which might also be time-varying (e.g. macroeconomic conditions, family status etc.). On the basis of the assumptions made about the time-varying nature of h_t, we distinguish between *proportional hazard models* and the *accelerated failure time models*. In the former class of models, the probability of exiting from unemployment is represented as the product of the so-called *baseline hazard* λ_t, which is itself a function of time, and the explanatory factors x, which in these models change the position but not the slope of the hazard function. To estimate this model we need to add an error term i.e. a random variable v, which captures unobservable influences and is taken to be orthogonal to the independent variables x. The hazard function to be estimated could be succinctly presented as follows:

$$h_{t;x} = v * \lambda_t * exp\{G(x;\beta)\} \quad (1)$$

Usually a further assumption made is about the multiplicative impact of the explanatory variables so that equation (1) becomes:

$$h_{t;x} = v * \lambda_t * exp(\beta x) \quad (2)$$

Two important distinctions can be made in estimating these models depending on: (a) the adoption or otherwise of a specific statistical distribution for the baseline hazard and (b) the distribution assumed for the random variable v. Depending on the distribution function regarding the baseline hazard, the models can be distinguished into *parametric, non-parametric* and *semi-parametric*. In parametric models, the baseline hazard is assumed to follow a specific statistical distribution and the most commonly used distribution for modelling the exit from unemployment is the Weibull, which includes the exponential distribution as a special case.

If we assume that the baseline hazard follows a Weibull, then the 3 main functions (distribution function, survivor function and hazard function) can be written as follows:

$$F_t = 1 - exp(-\gamma t^{\alpha}) \quad (3)$$

$$f_t = \gamma a t^{\alpha-1} exp(-\gamma t^{\alpha}) \quad (4)$$

$$h_t = \gamma a t^{\alpha-1} \quad (5)$$

The adoption of the Weibull implies that the probability of exiting from unemployment changes monotonically; in other words, as the unemployment spell lengthens, the probability of exiting from unemployment continuously moves in the same direction. Specifically, depending on the value of α, if $\alpha>1$ ($\alpha<1$) the probability of exiting from unemployment increases (decreases) as the spell lengthens. If $\alpha=1$, we have a special case where the probability of exiting from unemployment does not change over time. In this last case, the Weibull distribution coincides with the exponential one. Survival models are estimated by maximum likelihood, and the likelihood function which is being maximised is the following:

$$L = \sum_{t=1}^{n+m} \{w_i \ln f_i + (1-w_t)\ln S_t\} \quad (6)$$

where n is the number of uncensored observations which contribute by f_t to the likelihood function and m is the number of censored observations which con-

tribute by S_t to the likelihood function. The weight w takes the value 1 for uncensored observations and the value 0 for the remainder.

When a specific distribution function for the baseline hazard has not been selected, then semi-parametric or non-parametric models are being estimated. The most popular estimation method in the economics literature is Cox's proportional hazards method,[4] where no specific function is adopted for λ_t. In this model the independent variables shift the baseline hazard proportionately.

4 See Cox (1972).

6. Descriptive statistics of the sample used in the estimation of the transition model

Table A12

Distribution of the school-to-work transition period by gender[1]

(Percentages)

	Men	Women
Up to 2 months (inclusive)	7.5	8.5
3-11 months	4.6	10.4
12-23 months	13.0	19.1
24-47 months	33.7	28.2
over 47 months	41.2	33.8
Total	**100.0**	**100.0**

1 Comprises only individuals who moved from school into a significant job. A *significant job* is defined in the survey as a job which started after leaving continuous education and had a duration of a minimum of 6 months with at least 20 hours per week.

Source: Calculations based on the 2000 LFS *ad hoc* module on school-to-work transitions.

Table A13

Means of the variables used in the school-to-work transition model[1]

	Men	Women
Demographic features		
Percentage married	9.10	22.08
Percentage with foreign nationality	4.48	2.94
Percentage residing in urban areas	64.11	72.96
Percentage residing in semi-urban areas	13.62	10.77
Percentage residing in rural areas	22.27	16.27
Percentage of those who were over 18 when they completed their studies	52.17	66.14
Socio-economic features of the family		
Percentage of self-employed with employees (%)	9.88	8.15
Education level and field of study		
Percentage of students with a post-graduate qualification	0.53	0.57
Percentage of physical education graduates	1.26	0.86
Percentage of teacher education graduates	0.38	3.20
Percentage of humanities' graduates	1.01	5.67
Percentage of social sciences graduates	0.25	0.86
Percentage of business and economics graduates	2.49	2.84
Percentage of law school graduates	0.49	1.33
Percentage of medical school graduates	1.01	1.01
Percentage of life, physical and mathematical sciences graduates [2]	1.75	1.40
Percentage of engineering and architecture graduates	2.42	1.11
Percentage of Technological Education Institutes (TEI) graduates	5.08	7.61
Percentage of higher technical and vocational school graduates	12.53	22.01
Percentage of military training school graduates	1.40	0.18
Percentage of secondary technical and vocational school graduates	16.49	7.79
Percentage of upper secondary school graduates	31.09	32.85
Percentage of lower secondary school graduates	15.90	6.57
Percentage of primary school graduates	5.92	4.13

1 The figures presented correspond to the sample under investigation. Since the sample refers only to individuals 15-30 years old who completed their studies in the period 1990-2000, the figures above differ from the corresponding figures for the population as a whole. Specifically individuals with longer duration of studies (e.g. medical and engineering school graduates) are over-represented in the sample.

2 Agricultural schools, environmental and natural resources studies, physics and mathematics.

Source: Calculations on the basis of the 2000 LFS *ad hoc* module on school-to-work transition.

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An operational framework for the short-term forecasting of inflation*

The only function of economic forecasting is to make astrology look respectable

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1. Introduction

Forecasting inflation and macroeconomic developments in general is mainly a judgmental job, in which personal assessment and information of a non-purely quantitative nature play a decisive role in shaping the final outcome. The lack of adequate knowledge about the exact structure of the economy for a precise representation of the underlying links between the fundamental variables under consideration, the difficulty of knowing the cyclical position of the economy in real time and, chiefly, the non-stationary nature of economic developments, which makes future shocks practically impossible to predict, largely explain the importance of subjective assessment in the entire forecasting process. At the same time, however, economic forecasts must be comprehensible and fully explainable both to the public (thus helping to shape realistic expectations) and to policy makers (so that the forecasts can be taken on board in decision-making). Furthermore, the importance of transparency in the forecasting process should not be underestimated, since it is directly linked to the process's credibility.

In recent years, the conduct of an effective monetary policy by central banks and, to some extent, the globalisation of inflation, have contributed to the deceleration of inflation and, at the same time, to the considerable reduction in inflation volatility.[1] Against this background, inflation has,

* The views expressed herein are those of the authors and not necessarily those of the Bank of Greece. Thanks are extended to Isaac Sabethai for his valuable comments. Any errors or omissions remain the authors' own.

1 The standard deviation of inflation in Greece fell from 7.04% during the period 1981-2001 to 0.3% during the period 2002-2006.

on one hand, become easier to forecast, since, compared with the 1970s and 1980s, forecasting errors have been significantly reduced. However, seen from another perspective, inflation has in fact become harder to forecast: in an environment of low inflation volatility, it is difficult to improve upon a forecast that is based on simple univariate statistical models, by using more sophisticated models that also take the determinants of inflation into account.[2]

This paper poses the following two questions with regard to short-term inflation forecasting in Greece:

1. Can forecasts, generated by simple benchmark models, be improved by adding variables that reflect economic activity, labour cost, oil prices, the exchange rate, etc?

2. Are the suggested more sophisticated models a useful tool in the forecasting process? And, pursuing this logic further, can forecasts, to the extent that they are an inherent part of decision-making, provide credible information for the formulation of economic policy?

The answer to the first question is an unequivocal yes, while the answer to the second one, and particularly the second sub-question, is also positive, but subject to certain conditions.

The objective of this paper is to contribute to a better monthly inflation forecast in Greece by creating a forecasting framework, which, without sacrificing methodological rigour, could improve inflation forecasting by allowing the incorporation of expert judgments. In other words, to the extent that forecasts are an essential part of economic policy decision-making, we shall attempt to combine fully mechanical econometric projections with purely empirical evaluations, and to make the inflation forecasting process more transparent and comprehensible, so that inflation forecasts can ultimately serve as an effective tool in formulating economic policy. It is our belief that the suggested price forecasting approach will help to mitigate the widespread scepticism with which economic policy-makers usually perceive forecasting models, in terms of their usefulness for formulating scenarios and forecasts in the economic decision-making process. Moreover, it may even help to refute Galbraith's famous quote cited at the very start of this paper!

The paper is structured as follows: Section 2 presents the econometric framework for the short-term monthly forecasting of the harmonised index of consumer prices (HICP), the consumer price index (CPI), as well as their main components. The model consists of a set of short-term dynamic equations, designed for each of the HICP sub-indices, as well as for the two overall indices (HICP and CPI), so as to produce monthly inflation forecasts for a horizon of up to 18 months ahead. Section 3 explores the central question posed by this paper, namely whether the proposed price model can achieve more accurate forecasts than those generated by simple benchmark models. The potential improvement in inflation forecasting achieved with the suggested model, relative to the benchmark models, is first examined using a rolling out-of-sample forecasting procedure with the underlying loss function defined under two different statistical forecasting

2 This issue is addressed extensively by J. Stock and M. Watson (2006).

criteria (root mean squared error and mean absolute error). In a second stage, formal statistical tests (mainly in-sample) are carried out. The conclusion we reached is that the forecast generated by the simple forecasting benchmark models can, at least in the short run, be improved upon by incorporating variables concerning economic activity, labour cost, oil prices, the exchange rate, etc. Section 4 summarises the paper and suggests how the inflation forecasting framework can be implemented.

2. The short-term inflation forecasting model

The short-term inflation forecasting model (henceforth referred to as the STIF model or STIFM)[3] consists of a set of short-term dynamic equations for the HICP sub-indices and the two overall consumer price indices, namely the CPI and the HICP. More specifically, apart from the two overall inflation indices, forecasting equations were also formulated for the main HICP sub-components, namely non-energy goods (HEX),[4] energy goods (HEG), unprocessed food (UNPROC), processed food (PROC) and services (SERV). The specification of the model's equations is data-instigated rather than derived from a formal theoretical model of price determination. The empirical formulation of the model exploits the autocorrelation structure of the data, as well as the key inflation determinants. In this approach, the role of economic theory is rather limited and serves only to select the exogenous variables that have been shown to play a decisive role in inflation developments in Greece. The exogenous variables used in the model are the following: oil prices (POILU) in US dollars, the US dollar/euro ($/€) exchange rate (EXR), foreign prices, in US dollars, of food (COMFD) and non-food (COMFDX) commodities, the producer price index (PPI), the capacity utilisation rate in industry (CAP), and total economy unit labour cost (ULC) or, alternatively, compensation per employee (WUN).[5]

The equations for the model were selected according to the standard practice in this type of study by a pseudo real-time forecasting procedure, while the goodness-of-fit of the equations over the period under investigation and the plausibility of their coefficients were also taken into consideration. Given that the model is intended exclusively for short-term inflation forecasting, the specification of the dynamic equations does not include long-run equilibrium relationships. The estimation covers the period Jan. 1996-Dec. 2006 and was carried out with non-seasonally adjusted data. Seasonal dummies were added to all the equations, based on the assumption that the seasonal pattern of inflation is stable over time.

A tabular overview of the specifications of the price equations is provided in Table 1.[6]

The model can be used to perform an initial benchmark forecast, relying exclusively on the model and the assumptions made about the pro-

3 Similar models have also been constructed by other central banks in the Eurosystem, as well as by the ECB for inflation forecasting at a euro area level (see Benalal *et al.*, 2004, and Fritzer *et al.*, 2002).
4 More specifically: goods excluding energy and food.
5 It should be noted that the last two variables (ULC, WUN) are expressed in annualised monthly rates of change. Projections of the producer price index and the capacity utilisation index over the forecasting period are based on auxiliary equations appended to the model. Values for the other exogenous variables were drawn from various sources (mainly international organisations).
6 Full estimation results are available from the authors upon request.'

Table 1
Explanatory variables included in the STIF model

Overall HICP	Overall CPI	HEX	HEG	UNPROC	PROC	SERV
LDV (1,5,6,12)	LDV (1,5,6,12)	LDV (1,2,4)	LDV (1,2)	LDV (1,2,4)	LDV (1)	LDV (1,2,3,10,11)
SD	SD	SD	SD	SD	SD	SD
DV	DV	DV			DV	DV
POILU/EXR (0)	POILU/EXR (0)		POILU/EXR (0,1)			
ULC (0.12)	ULC (0.12)	ULC (12)				
					WUN (2)	WUN (12)
COMFD/EXR (9)	COMFD/EXR (9)				COMFD/EXR (11)	
					COMFDX/EXR (1)	
PPI (6)	PPI (3)					
					UNPROC (3)	UNPROC (1)
		CAP (11,12)			CAP (0)	

Definitions: Overall HICP: Harmonised Index of Consumer Prices, all items; Overall CPI: Consumer Price Index, all items; HEX: Non-energy goods; HEG: Energy goods; UNPROC: Unprocessed food; PROC: Processed food; SERV: Services; LDV: Lagged dependent variables; SD: Seasonal dummies; DV: Dummy variables; POILU: Oil prices in US dollars; EXR: US dollar/euro ($/€) exchange rate; ULC: Total economy unit labour cost; WUN: Compensation per employee; COMFD: Foreign prices, in US dollars, of food commodities; COMFDX: Foreign prices, in US dollars, of non-food commodities; PPI: Producer price index; CAP: Capacity utilisation rate in industry.

Note: Numbers between brackets are the lags included in the models. All variables were transformed into first log differences, with the exception of unit labour cost (ULC) and wages (WUN), which are expressed as rates of change and were therefore transformed into simple first differences.

jected time path of the key inflation determinants. This projection can then be improved and enhanced with all of the relevant exogenous information available, i.e. information that could not be included in the model.

3. Evaluation of the model's forecasting ability, a "horse race"

3.1 The benchmark models

This section examines the first of the two main questions posed in this paper, namely whether the proposed price model can improve upon the forecast generated by simple linear benchmark models.

First, it should be noted that for a model to be considered a good benchmark model, it must contain a minimum number of properties, summarised as follows:

a. Generally, it should have a reasonably good forecasting performance.

b. It should be easy to estimate and produce forecasts from.

c. It should have parameters that are fairly constant over time and a stable forecasting performance.

Recent research has shown that univariate, linear autoregressive models meet these requirements

rather well. By contrast, non-linear models, time-varying parameter models, models allowing smooth parameter evolution across "regimes", abrupt switching-regime models or threshold models, though sometimes capable of producing very accurate forecasts for a specific period of time, present the drawback of being highly sensitive and dependent upon the estimation period chosen, which makes them inappropriate for use as benchmark models.[7]

The formulation of a generic forecasting model is:

$$\pi_{t+h} = f(Z_t, \Theta) + \varepsilon_{t+h} \quad (1)$$

where π_{t+h} denotes the inflation forecast over a horizon of h steps ahead, f is the functional form of the model, which describes both the inflation forecasting model and the competing benchmark models, Z is the vector of exogenous and predetermined variables, Θ is the set of parameters and ε_{t+h} is the forecast error at horizon h.

In this exercise, the suggested inflation model is assessed in terms of its forecasting ability against a set of competing univariate benchmark models, including autoregressive models of different order (of one and three lags) and simple random walk models under a different selection of exogenous variables (mainly seasonal dummies). The forecasting performance of the model is evaluated by a pseudo real-time forecasting exercise. Out-of-sample model evaluation has become quite a widespread practice for model selection since the influential work of Stock and Watson (1999). Out-of-sample comparison is, generally speaking, a stricter and, in one sense, a more robust model evaluation and selection practice, since the out-of-sample data have not been used in the estimation; conditions are therefore more suitable and closer to actual forecasting conditions. The loss function is determined on the basis of two criteria: the root mean squared error (RMSE) and the mean absolute error (MAE). Moreover, formal statistical tests, based on the encompassing principle (see Mizon and Richard, 1986) are carried out,[8] while the statistical significance of the forecast improvement is tested, using the statistical test of equal predictive ability proposed by Diebold and Mariano (1995).

3.2 The results of the pseudo real-time forecasting exercise

The forecasting performance of the STIFM is compared with that of competing benchmark models over the period Jan. 2003-Dec. 2006. The pseudo real-time forecasting exercise is implemented as follows: First, we estimate the price model for the period Feb. 1997-Dec. 2002, leaving a period of four years (48 observations) for the assessment of the forecast performance. A dynamic 18-step ahead forecast is then drawn from the model.[9] The procedure is repeated, adding an extra observation each time, estimating the model anew and executing the 18-period ahead dynamic forecast. The procedure is sequentially repeated until the entire sample of observations has been exhausted. The same exact procedure is repeated for all the competing models, as well as for all the respective variables (overall indices and sub-components). In

7 These issues have been extensively analysed by Marcellino (2006) and Kapetanios (2006).
8 These tests are performed mainly within the estimation period.
9 The selection of a horizon of 18 steps (months) ahead corresponds to the longest period capable of being considered short-term.

all of the rolling forecasts (30) and for all the forecasting horizons (18), but also for all the variables of the proposed price model as well as the competing models, the respective RMSE and MAE are calculated by comparing the forecast figures with the actual values.

The RMSE and MAE are calculated using the standard formulas:

$$\text{RMSE} = \sqrt{\sum_{t=T+1}^{T+h} \frac{(\hat{\pi}_t - \pi_t)^2}{\text{h}}} \quad (2)$$

$$\text{MAE} = \sum_{t=T+1}^{T+h} \frac{|\hat{\pi}_t - \pi_t|}{\text{h}} \quad (3)$$

where π_t and $\hat{\pi}_t$ respectively denote current and forecast inflation and h is the forecast horizon.

Inflation in both formulas is calculated on an annual basis, since the discussion, as well as the presentation of forecasts by the Eurosystem's central banks, tend to focus on annual rates of change.

The rather large number of RMSEs and MAEs obtained with the aforementioned process for all the estimation periods and the forecasting horizons make the results difficult to assess directly. To overcome this problem, we therefore calculated the average value of the criteria in the forecast periods, for each forecast horizon and each endogenous variable in the models. In order to make the results easier to understand and interpret, we expressed the RMSE and MAE values derived from the proposed STIF model in relative terms, by dividing them by the respective RMSE and MAE values obtained with the competing benchmark models. A value smaller than 1 suggests that, based on the criteria used, the STIFM has a better forecasting ability than the competing benchmark models.

Tables 2 and 3 present the relative values of RMSE and MAE for the STIFM over the competing benchmark models.[10]

As these tables show, the STIFM performs better than the respective benchmark models up to 13 periods ahead for the HICP and up to 10 periods ahead for the overall CPI. For the respective sub-indices, the STIFM performs more accurately across all forecasting horizons. Therefore, there is a definite forecast gain from the use of the suggested model and, what is more, the results do not depend on the choice of the loss function.

3.3 Forecast encompassing

Broadly speaking, an empirical model encompasses a competing rival model if it can account for the properties and the characteristics of the competing model. The principle of parametric encompassing was first introduced in the literature by Hendry and Richard (1982), Mizon (1984) and Mizon and Richard (1986). Chong and Hendry (1986) formulated a statistical test based on the encompassing principle and applied it to a forecasting environment. According to Chong and Hendry, an empirical model encompasses, in forecasting terms, a rival model when the competing model's forecast cannot provide further information on the one step ahead forecast error of the empirical model. This is due to the fact that,

10 The absolute RMSE and MAE values are presented in the Appendix, Tables A1 and A2.

Table 2
Relative root mean square error (RMSE) values

Models	1-month horizon	3-month horizon	6-month horizon	12-month horizon	18-month horizon
HICP					
STIFM/AR1	0.8104	0.9009	0.9511	0.9714	1.0696
STIFM/AR3	0.8065	0.8889	0.9436	0.9658	1.0652
STIFM/RW	0.4604	0.3853	0.2878	0.1868	0.1638
STIFM/RW2	0.1484	0.1018	0.0797	0.0519	0.0466
CPI					
STIFM/AR1	0.8532	0.9224	0.9686	1.0393	1.1523
STIFM/AR3	0.7723	0.8999	0.9533	1.0276	1.1903
STIFM/RW	0.5158	0.4307	0.3215	0.2291	0.2074
STIFM/RW2	0.1754	0.1216	0.0982	0.0698	0.0646
HEX					
STIFM/AR1	0.9333	0.8790	0.8652	0.7933	0.7504
STIFM/AR3	0.8537	0.8204	0.8373	0.8136	0.7840
STIFM/RW	0.6194	0.4214	0.3250	0.2398	0.2223
STIFM/RW2	0.1691	0.1050	0.0828	0.0614	0.0581
HEG					
STIFM/AR1	0.5866	0.5749	0.4786	0.4130	0.4248
STIFM/AR3	0.5971	0.5817	0.4804	0.4133	0.4275
STIFM/RW	0.4593	0.3186	0.2106	0.1559	0.1589
STIFM/RW2	0.4723	0.3223	0.2052	0.1460	0.1499
PROC					
STIFM/AR1	0.8423	0.8829	0.8831	1.0133	0.9781
STIFM/AR3	0.8259	0.8831	0.8986	1.0317	0.9885
STIFM/RW	0.6902	0.5983	0.4857	0.3834	0.3373
STIFM/RW2	0.8536	0.6383	0.4754	0.3566	0.3155
SERV					
STIFM/AR1	0.8024	0.7141	0.9120	0.9450	0.9464
STIFM/AR3	0.8525	0.7557	0.9471	0.9372	0.9298
STIFM/RW	0.4607	0.2644	0.2229	0.1648	0.1561
STIFM/RW2	0.4116	0.2506	0.2071	0.1508	0.1424

Note: STIFM: short-term inflation forecasting model
AR1: Autoregressive model of order 1
AR3: Autoregressive model of order 3
RW: Random walk model with seasonal dummies
RW2: Random walk model

in a well-defined model, forecast errors are "innovation processes" and are therefore non-predictable on the basis of the information available at the time of the forecast.

The application of the test requires us to estimate the auxiliary model:

$$\hat{\varepsilon}^{k}_{t+s} = \alpha + \beta \pi^{f}_{t+s} \qquad (4)$$

Table 3
Relative mean absolute error (MAE) values

Models	1-month horizon	3-month horizon	6-month horizon	12-month horizon	18-month horizon
HICP					
STIFM/AR1	0.8104	0.9441	1.0148	1.0151	1.1196
STIFM/AR3	0.8065	0.9315	1.0064	1.0074	1.1119
STIFM/RW	0.4604	0.3863	0.2793	0.1796	0.1549
STIFM/RW2	0.1484	0.1030	0.0774	0.0500	0.0438
CPI					
STIFM/AR1	0.8532	0.9492	1.0117	1.0415	1.1433
STIFM/AR3	0.8288	0.9294	1.0009	1.0237	1.1247
STIFM/RW	0.5158	0.4344	0.3180	0.2202	0.1972
STIFM/RW2	0.1754	0.1240	0.0969	0.0673	0.0611
HEX					
STIFM/AR1	0.9333	0.8781	0.8690	0.7952	0.7445
STIFM/AR3	0.8537	0.8217	0.8402	0.8185	0.7790
STIFM/RW	0.6194	0.4133	0.3183	0.2353	0.2122
STIFM/RW2	0.1691	0.1035	0.0807	0.0604	0.0552
HEG					
STIFM/AR1	0.5866	0.5782	0.4623	0.4042	0.4106
STIFM/AR3	0.5971	0.5786	0.4627	0.4037	0.4122
STIFM/RW	0.4593	0.3217	0.2060	0.1527	0.1511
STIFM/RW2	0.4723	0.3289	0.2010	0.1440	0.1432
PROC					
STIFM/AR1	0.8423	0.8876	0.8685	0.9717	0.9710
STIFM/AR3	0.8259	0.8879	0.8827	0.9913	0.9860
STIFM/RW	0.6902	0.6031	0.4775	0.3773	0.3241
STIFM/RW2	0.8536	0.6542	0.4770	0.3560	0.3032
SERV					
STIFM/AR1	0.8024	0.7032	0.9275	0.9656	0.9183
STIFM/AR3	0.6160	0.5910	0.7257	0.8452	0.9026
STIFM/RW	0.4607	0.2553	0.2150	0.1614	0.1472
STIFM/RW2	0.4116	0.2415	0.2011	0.1484	0.1346

Note: STIFM: Short-term inflation forecasting model
AR1: Autoregressive model of order 1
AR3: Autoregressive model of order 3
RW: Random walk model with seasonal dummies
RW2: Random walk model

where $\hat{\varepsilon}^{k}_{t+s}$ is the one step ahead forecast error of model k at the forecasting period $t+s$, and π^{f}_{t+s} is the forecast of the competing model f at the same period $t+s$.

Under the null hypothesis of correct specification of model k, coefficient β of the competing model f in equation (4) should not statistically differ from zero. The competing model f fails to improve

Table 4
Forecast encompassing test[1]

Models	Competing models				
	Constant term t-statistic	AR1 t-statistic	AR3 t-statistic	RW t-statistic	RW2 t-statistic
HICP					
Model 1	–0.602	–0.258			
Model 2	–0.613		–0.183		
Model 3	–0.721			–1.666	
Model 4					–0.674
Model 5		–0.269	0.322	–1.212	–0.894
CPI					
Model 1	–0.705	–1.311			
Model 2	–0.703		–1.284		
Model 3	–1.030			–1.615	
Model 4					–0.974
Model 5		–0.073	0.061	–0.614	–0.834

1 Null hypothesis Ho: the competing models fail to encompass the STIFM in terms of forecasting ability.

upon the forecasts of model k and the assumption that k is encompassed by f cannot be ruled out. The forecast encompassing test statistics are the t-statistics of coefficient β in equation (4). The forecast encompassing test can be generalised by inserting the forecasts generated by a set of competing models in equation (4). The statistical significance of the constant in (4) implies a systematic error in the forecasts of the model under consideration.

In order to evaluate the suggested STIF model with the forecast encompassing test, equation (4) was estimated using as dependent variable the one step ahead forecast errors of the overall HICP and CPI equations over a horizon of 18 months. Specifically, (4) was estimated over the period June 2005-Dec. 2006 using as dependent variable the forecast errors of the two overall indices and as independent variables the respective forecasts of the four competing models over the same period. The results of these estimates are presented in Table 4.

As shown in Table 4, the competing models fail to improve upon the inflation forecasting performance of the suggested price model. The competing models fail to reject the hypothesis of forecast encompassing by the proposed forecasting model. The same holds true either when estimates are performed with separate regressions of the errors on the forecast of the competing models or on the forecast of the more general model which incorporates the forecasts of all the competing models.[11]

11 The results of the tests presented in Table 4 are based on the estimates of errors and forecasts within the estimation period, meaning that the models were initially estimated for the entire period up to December 2006 (ex-post forecasting). The tests were then repeated for the same period, but this time the initial models were estimated only up to June 2005, so that the testing period did not coincide with the estimation period. Even this tighter requirement did not modify the results, which we have chosen to omit here for sake of brevity.

Table 5

Diebold-Mariano forecast accuracy tests, RMSE loss function

(1st version)

	AR1 t-statistic	AR3 t-statistic	RW t-statistic	RW2 t-statistic
HICP				
Constant term	–2.152*	–2.123*	–1.190	–22.120*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	–1.403	–1.383	–0.778	–22.250*
CPI				
Constant term	1.031	1.032	1.339	–15.854*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	0.639	0.640	0.831	–12.940*
HEX				
Constant term	–1.866	–1.467	–6.390*	–18.405*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	–1.218	–0.948	–3.916*	–13.419*
HEG				
Constant term	–15.234*	–19.189*	–10.169*	–10.227*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	–9.591*	–12.075*	–6.284*	–6.337*
PROC				
Constant term	19.687*	15.709*	–7.761*	–8.241*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	13.298*	11.754*	–4.586*	–5.109*
SERV				
Constant term	–2.266*	–2.161*	–9.221*	–3.654*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	–1.429	–1.340	–5.709*	–2.318*

* Indicates a rejection of the null hypothesis (Ho), i.e. of the equal forecasting performance of the compared models, at a significance level of $\alpha = 5\%$.

3.4 The Diebold and Mariano (D-M) forecast accuracy test

The forecast accuracy measures (RMSE and MAE) analysed in Section 3.2 are descriptive and comparative forecast accuracy indices, which obviously do not provide answers to the statistical inference problem as to whether the forecasting improvement is also statistically significant in terms of a given loss function. Diebold and Mariano (1995) proposed a formal statistical procedure for testing the hypothesis of equal forecasting ability of two competing models, using a selected loss function. In other words, the (D-M) procedure tests the validity of the hypothesis that the forecasts generated by two competing models k and f are statistically equal. The "null hypothesis" of the test is that the anticipated differential loss $E\{d\}$ between the compared models is zero:

Table 6

Diebold-Mariano forecast accuracy tests, MAE loss function

(1st version)

	AR1 t-statistic	AR3 t-statistic	RW t-statistic	RW2 t-statistic
HICP				
Constant term	–1.017	–1.002	–2.873*	–23.281*
Constant term, with heteroskedasticity consistent covariable (Newey-West HAC)	–0.652	–0.642	–1.908	–23.102*
CPI				
Constant term	0.519	0.504	0.731	–17.417*
Constant term, with heteroskedasticity consistent covariable (Newey-West HAC)	0.324	0.315	0.458	–14.731*
HEX				
Constant term	–2.823*	–2.347*	–6.707*	–17.744*
Constant term, with heteroskedasticity consistent covariable (Newey-West HAC)	–1.815	–1.493	–4.118*	–12.502*
HEG				
Constant term	–15.692*	–20.210*	–10.301*	–10.466*
Constant term, with heteroskedasticity consistent covariable (Newey-West HAC)	–9.762*	–12.545*	–6.368*	–6.476*
PROC				
Constant term	24.083*	20.954*	–7.456*	–7.875*
Constant term, with heteroskedasticity consistent covariable (Newey-West HAC)	15.483*	14.247*	–4.586*	–4.866*
SERV				
Constant term	–1.932	–1.403	–9.332*	–3.629*
Constant term, with heteroskedasticity consistent covariable (Newey-West HAC)	–1.210	–0.862	–5.784*	–2.313*

* Indicates a rejection of the null hypothesis (Ho), i.e. of the equal forecasting performance of the compared models, at a significance level of α= 5%.

$$E\{d\} = E\{L(\varepsilon^k_{t+s})\} - E\{L(\varepsilon^f_{t+s})\} = 0 \qquad (5)$$

where ε^k_{t+s} and ε^f_{t+s} are the forecasts produced by competing models k and f over an s steps ahead horizon and L is the loss function.

The (D-M) testing procedure was applied in two different versions. In the first version, the regressions were estimated using as dependent variable the differences (between the proposed and the competing models) of the 18 average values of the RMSE and MAE functions calculated with the pseudo real-time 30-period forecasting procedure. The regressions were carried out for all variables (overall and sub-indices) and for all models (STIFM and benchmarks) and cover all the forecast horizons. The results of these tests are presented in Tables 5 and 6.

The results of Tables 5 and 6 show that for the overall indices (HICP and CPI), the hypothesis of

Table 7

Diebold-Mariano forecast accuracy tests, RMSE loss function

(2nd version)

	AR1 t-statistic	AR3 t-statistic	RW t-statistic	RW2 t-statistic
	3-month horizon			
HICP				
Constant term	–1.145	–1.325	–3.758*	–8.198*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	–1.008	–1.176	–3.407*	–9.672*
CPI				
Constant term	–0.950	–1.305	–3.783*	–7.715*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	–0.935	–1.328	–3.411*	–8.879*
	12-month horizon			
HICP				
Constant term	–0.654	–0.801	–3.959*	–5.795*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	–0.612	–0.717	–3.591*	–8.697*
CPI				
Constant term	0.598	0.467	–4.031*	–5.464*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	0.467	0.348	–3.649*	–7.914*
	18-month horizon			
HICP				
Constant term	1.784	1.717	–4.036*	–5.536*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	1.342	1.238	–3.730*	–8.50*
CPI				
Constant term	2.78*	3.491*	–4.106*	–5.215*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	1.952	3.093*	–3.901*	–7.723*

* Indicates a rejection of the null hypothesis (Ho), i.e. of the equal forecasting performance of the compared models, at a significance level of α= 5%.

equal forecasting performance is rejected for the "random walk" model, which produces forecasts significantly different and inferior in statistical terms (on the basis of the results of the rolling forecast procedure) to those of the STIF model. This result holds for both loss functions. However, the competing AR1 and AR3 models, which in RMSE and MAE terms provide more accurate out-of-sample forecasts than the ones provided by the STIFM for both overall indices, fail to reject the equal forecast performance hypothesis within the conventional bounds of statistical error. For the HICP sub-indices, most of the results suggest that the STIFM forecasts, which are generally better

Table 8

Diebold-Mariano forecast accuracy tests, MAE loss function

(2nd version)

	AR1 t-statistic	AR3 t-statistic	RW t-statistic	RW2 t-statistic
	3-month horizon			
HICP				
Constant term	–0.621	–0.787	–3.552*	–7.741*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	–0.565	–0.726	–3.312*	–9.320*
CPI				
Constant term	–0.605	–0.920	–3.587*	–7.382*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	–0.579	–0.909	–3.268*	–8.558*
	12-month horizon			
HICP				
Constant term	0.252	0.128	–3.965*	–5.812*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	0.242	0.115	–3.606*	–8.580*
CPI				
Constant term	0.528	0.341	–4.051*	–5.467*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	0.432	0.262	–3.667*	–7.788*
	18-month horizon			
HICP				
Constant term	2.423*	2.326*	–4.026*	–5.567*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	1.918	1.740	–3.714*	–8.447*
CPI				
Constant term	2.333*	2.231*	–4.096*	–5.229*
Constant term, with heteroskedasticity consistent covariances (Newey-West HAC)	1.723	1.544	–3.877*	–7.656*

* Indicates a rejection of the null hypothesis (Ho), i.e. of the equal forecasting performance of the compared models, at a significance level of α= 5%.

than those of the competing models, are also statistically much more accurate.[12] This result holds for both loss functions.

In the second version, the testing procedure was applied to the differences of the loss functions between the STIFM and the competing models, ranked in forecast horizons of 3, 12 and 18 steps ahead. In other words, the test was conducted sequentially for each of the selected forecast horizons by calculating the differences of the loss

12 This result is, to a satisfactory extent, also valid for the autocorrelation-corrected t-statistics.

functions between the STIFM and the competing models, as obtained with the 30-period sequential procedure. The test was conducted for both overall indices, and the results of the relevant regressions are presented in Tables 7 and 8.

The results of these last tests agree more or less with our previous findings. Across all horizons and for both loss functions, the forecasts from the random walk models reject the hypothesis of equal forecast performance. The STIFM forecasts are significantly different in statistical terms and more accurate (on the basis of the RMSE and MAE functions) than the forecasts generated by the two competing models.

At the 18-step horizon, the AR1 and AR3 models produce more accurate forecasts than the STIFM only for the CPI and the HICP. The equal forecasting performance hypothesis cannot be rejected when the relevant regressions are carried out by adjusting variances for heteroskedasticity (HAC). At the 3- and 12-step horizons, the equal forecasting performance hypothesis cannot be rejected when the AR1 and AR3 models are tested against the STIFM.

Testing the models' forecasting performance involves numerous forecasting horizons and several variables. Therefore, it is difficult, if not impossible, to come up with one overall winner that outperforms all rival models.[13] However, the results we obtained show that the STIFM outperforms the competing benchmark models in terms of forecasting ability. Moreover, even in the cases where it did not perform better, the superiority of the rival models in terms of forecasting accuracy was usually not statistically significant. In addition, the competing models failed to reject the forecast encompassing hypothesis against the STIFM; in other words, the competing models failed to improve upon the forecast generated by the STIFM, at least at the horizons for which the hypothesis was tested. The results obtained so far support the operational usefulness of the STIFM.

4. Guidelines for the application of the inflation forecasting framework – summary

When Greece joined the euro area, part of the responsibility for controlling domestic inflation was transferred to the European Central Bank (ECB), which conducts a forward-looking monetary policy and pursues an objective of medium-term price stability for the euro area *as a whole*, in accordance with its own quantitative definition of price stability. As monetary policy is implemented at a euro area level, the national central banks are obviously responsible for controlling and monitoring domestic inflation, and for providing credible and accurate inflation forecasts. The present paper contributes to the attainment of this task by presenting a framework that can help improve short-term inflation forecasting in Greece, so that these forecasts can play a role in the formulation of domestic policies.[14] The STIF model was compared with simple competing benchmark models and seems to have a better forecasting performance: in fact, even in the cases where it failed to

13 Constructing a theory-based empirical model capable of "outperforming" the respective random walk model in terms of forecasting ability is in itself an achievement and the STIFM is indeed a "winner". See the well-known examples for exchange rates presented by Meese and Rogoff (1983) and for the Phillips curve presented by Ohanian (2001).

14 Alan Greenspan once said: "Implicit in any monetary policy action or inaction is an expectation of how the future will unfold, that is, a forecast".

perform better, the superiority of the competing models in terms of forecast accuracy was usually not statistically significant. Furthermore, the STIFM performed better than the strictly judgmental forecasts. Only for the current and the upcoming month were the forecasts, obtained by judgmental methods, more accurate than those generated by the STIFM. This overall conclusion is encouraging with regard to the operational usefulness of the STIFM in inflation forecasting by the Bank of Greece. Once again, however, it should be stressed that there is no "single winner" that systematically outperforms all competing models. In the current juncture of low and rather steady inflation, where time series contain little information and inflation dynamics have changed considerably, a very promising but much more sophisticated strategy for accurate forecasting would be to construct sets of models and to put them in competition with each other, thereby transforming the "horse race" into a contest between "horse stables". We intend to deal with this issue in a forthcoming paper.

That said and considering that the main purpose of this paper was to achieve a judicious blend and an effective conjunction of purely judgmental forecasts and mechanical projections which take into account the determinants of inflation, the STIFM could be used as follows:

The empirical results of the paper suggest that, for the current as well as for the upcoming month, inflation forecasting is more accurate when performed on a *judgmental* basis by price experts. However, with regard to the energy price component, it would be advisable to incorporate data from the European Commission's "Oil Bulletin"[15] into the experts' judgmental forecast. This judgmental forecast for the current and the upcoming month could then be plugged into the STIF model, and, based on the agreed assumptions, a *mechanical* projection could be conducted for the overall indices and respective sub-indices over a maximum horizon of 16 months. The results of this projection would need to be assessed by price experts, who could then improve the forecast by providing additional exogenous information that the STIFM could not contain. This projection, enhanced with judgmental interventions, could serve policy-makers as a benchmark forecast and a basis for further discussion. We believe that short-term inflation forecasting within the suggested empirical framework could make the business of forecasting easier to explain and understand, not to mention more transparent and, therefore, more credible. The application of the suggested systematic procedure leaves room for an ex-post evaluation and analysis of the forecasts: at this stage, the forecasting errors can be analysed, in order to determine whether they are due to errors in the formulation of the initial assumptions, to errors in judgment or to the impact of new data. The framework is easy to use: a baseline forecast can be quickly produced, after which the impact of various alternative conditioning assumptions could be successfully evaluated.

15 *Oil Bulletin*, European Commission Directorate General for Energy and Transport. This Commission bulletin contains fuel prices at the pump for the current month in all EU countries.

Appendix

Table A1

Root mean squared error (RMSE)

Models	1-month horizon	3-month horizon	6-month horizon	12-month horizon	18-month horizon
HICP					
STIFM	0.2100	0.3039	0.3486	0.3901	0.4237
AR1	0.2591	0.3373	0.3665	0.4015	0.3961
AR3	0.2604	0.3419	0.3694	0.4039	0.3977
RW	0.4560	0.7887	1.2112	2.0880	2.5864
RW2	1.4151	2.9861	4.3759	7.5226	9.1008
CPI					
STIFM	0.2170	0.3168	0.3744	0.4545	0.5086
AR1	0.2543	0.3435	0.3865	0.4373	0.4414
AR3	0.2810	0.3521	0.3927	0.4424	0.4273
RW	0.4207	0.7356	1.1643	1.9842	2.4528
RW2	1.2371	2.6056	3.8124	6.5164	7.8691
HEX					
STIFM	0.2608	0.3405	0.3960	0.5056	0.5809
AR1	0.2794	0.3873	0.4578	0.6373	0.7742
AR3	0.3055	0.4150	0.4730	0.6214	0.7410
RW	0.4210	0.8080	1.2186	2.1081	2.6131
RW2	1.5422	3.2430	4.7858	8.2389	9.9930
HEG					
STIFM	1.2893	1.9278	2.0499	2.6214	3.3014
AR1	2.1982	3.3533	4.2830	6.3472	7.7724
AR3	2.1593	3.3142	4.2672	6.3430	7.7227
RW	2.8070	6.0513	9.7320	16.8115	20.7808
RW2	2.7297	5.9820	9.9911	17.9580	22.0200
PROC					
STIFM	0.2553	0.4865	0.6802	0.9515	1.0656
AR1	0.3031	0.5510	0.7702	0.9390	1.0894
AR3	0.3091	0.5509	0.7569	0.9223	1.0780
RW	0.3699	0.8132	1.4004	2.4817	3.1594
RW2	0.2991	0.7622	1.4309	2.6683	3.3770
SERV					
STIFM	0.2522	0.2800	0.3676	0.4918	0.5985
AR1	0.3143	0.3922	0.4030	0.5204	0.6325
AR3	0.2958	0.3706	0.3881	0.5248	0.6438
RW	0.5474	1.0592	1.6492	2.9849	3.8344
RW2	0.6126	1.1174	1.7748	3.2608	4.2035

Note: STIFM: Short-term inflation forecasting model
AR1: Autoregressive model of order 1
AR3: Autoregressive model of order 3
RW: Random walk model with seasonal dummies
RW2: Random walk model

Table A2
Mean absolute error (MAE)

Models	1-month horizon	3-month horizon	6-month horizon	12-month horizon	18-month horizon
HICP					
STIFM	0.2100	0,2763	0.3049	0.3338	0.3632
AR1	0.2591	0,2927	0.3005	0.3288	0.3244
AR3	0.2604	0,2966	0.3029	0.3313	0.3266
RW	0.4560	0,7153	1.0915	1.8587	2.3440
RW2	1.4151	2,6815	3.9397	6.6711	8.2933
CPI					
STIFM	0.2170	0,2907	0.3315	0.3878	0.4368
AR1	0.2543	0,3063	0.3276	0.3723	0.3821
AR3	0.2618	0,3128	0.3312	0.3788	0.3884
RW	0.4207	0,6692	1.0424	1.7610	2.2152
RW2	1.2371	2,3448	3.4197	5.7654	7.1548
HEX					
STIFM	0.2608	0.3008	0.3474	0.4414	0.5026
AR1	0.2794	0.3426	0.3997	0.5550	0.6751
AR3	0.3055	0.3661	0.4134	0.5392	0.6452
RW	0.4210	0.7279	1.0914	1.8756	2.3691
RW2	1.5422	2.9076	4.3025	7.3105	9.1035
HEG					
STIFM	1.2893	1.7514	1.7836	2.2726	2.8375
AR1	2.1982	3.0289	3.8584	5.6228	6.9098
AR3	2.1593	3.0268	3.8545	5.6294	6.8840
RW	2.8070	5.4443	8.6604	14.8845	18.7844
RW2	2.7297	5.3253	8.8733	15.7802	19.8101
PROC					
STIFM	0.2553	0.4379	0.5877	0.8168	0.9012
AR1	0.3031	0.4933	0.6767	0.8406	0.9281
AR3	0.3091	0.4932	0.6659	0.8240	0.9140
RW	0.3699	0.7262	1.2308	2.1651	2.7810
RW2	0.2991	0.6694	1.2322	2.2946	2.9724
SERV					
STIFM	0.2522	0.2488	0.3210	0.4264	0.5069
AR1	0.3143	0.3539	0.3461	0.4416	0.5519
AR3	0.4094	0.4211	0.4424	0.5045	0.5616
RW	0.5474	0.9748	1.4934	2.6415	3.4437
RW2	0.6126	1.0303	1.5967	2.8733	3.7653

Note: STIFM: Short-term inflation forecasting model
AR1: Autoregressive model of order 1
AR3: Autoregressive model of order 3
RW: Random walk model with seasonal dummies
RW2: Random walk model

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Working Papers

(January – August 2007)

This section contains the abstracts of Working Papers authored by Bank of Greece staff and/or collaborators and published by the Bank of Greece. The unabridged version of these publications is available in print or electronic format on the Bank's website (www.bankofgreece.gr).

Contents

The balance sheet channel of monetary policy transmission: evidence from the UK

Working Paper No. 53
Eleni Angelopoulou and Heather D. Gibson

The balance sheet channel is an additional mechanism through which monetary policy can be transmitted to the real economy through financial market frictions. Bernanke and Gertler (1989) argued that the existence of information asymmetries implies that a firm's (or household's) net worth is likely to influence investment (and more generally spending) decisions. The implications are profound. First, since net worth tends to be procyclical, this will cause investment to move procyclically thus generating accelerator effects and magnifying the amplitude of economic cycles. Second, shocks to net worth which are independent of output can cause fluctuations. A subsidiary consequence of this is that even small monetary policy shocks could have large effects.

The majority of empirical papers in this area refer to the US, although the presence of financial constraints on firm investment policy is well-established for countries such as the UK. This paper investigates the relationship between firm financial constraints and monetary policy for the UK, using a panel of UK firms in manufacturing over the period 1970 to 1991. In addition to examining the impact of cash flow in different subsamples based on company size or financial policy (dividend payouts, share issues or debt accumulation), we also investigate the extent to which investment becomes more sensitive to cash flow in periods of monetary tightness. To this end, we employ a monetary tightness indicator constructed for the UK using the narrative approach pioneered by Romer and Romer (1989).

The results provide support for the view that, using firm size and firm financial policy to classify companies, potentially financially-constrained UK firms show greater investment sensitivity to cash flow. Firms as a whole also show greater sensitivity during periods of tight monetary policy and the effect is greater on those that are potentially financially-constrained. The results are fairly robust to alternative classifications of constrained/unconstrained firms and point to the possible existence of a balance sheet channel in addition to other possible transmission mechanisms such as interest rates, the exchange rate or a bank lending channel.

The implications of these findings are that, at least for the period under consideration here, financial accelerator effects were a determining characteristic of UK business cycles. At the same time, however, monetary policy was more effective at influencing the cycle since it operated not only via traditional channels such as the interest rate or exchange rate, but also through its effect on firms' net worth and hence spending decisions.

Identification of a loan supply function: a cross-country test for the existence of a bank lending channel

Working Paper No. 54
Sophocles N. Brissimis and Matthaios D. Delis

Bernanke and Blinder (1988) developed a simple structural model (BB model) to analyse the bank lending channel, which became the benchmark for future studies. They expanded the conventional IS-LM model to include the loan market, dropping the assumption of perfect substitutability between bank loans and bonds. In this framework, loan supply shifts play a key role in the propagation of monetary impulses, amplifying the effect on real output that works through the interest rate channel. Previous empirical work on the bank lending channel used either (i) time series data and the theoretical predictions of the BB model (but faced the problem of the simultaneous determination of loan supply and demand, or (ii) bank-level data and indirectly tested for loan supply shifts through estimation of reduced-form equations that examine the relationship between bank lending, a monetary policy variable and bank characteristics. Implicit in this latter approach is the assumption that, when heterogeneity in bank characteristics is present, loan supply shifts can be identified.

Given the limitations of this approach, we focus on the direct identification of the loan supply function from bank data, adopting the assumptions of the BB model as regards the loan market. Thus, we derive, at the individual bank level, a loan supply function that is free of the simultaneity problem and offers testable hypotheses pertaining to imperfect substitutability between loans and bonds in bank portfolios. In this context, perfect substitutability implies that a loan supply function cannot be defined. In a second step, we assess the impact of individual bank characteristics on banks' ability to supply loans by augmenting the above model to include a number of bank-characteristic variables (capitalisation, liquidity and size) and examining whether these can modify the test results obtained prior to their inclusion.

The proposed methodology was applied to a number of panel datasets corresponding to 16 OECD countries for the years 1996 to 2003. Among the countries examined, the lending channel plays a significant role only in Japan and Greece. In the former case this is mainly attributed to the financial distress of the 1990s, while in the latter recent financial deregulation has not been fully absorbed by banking institutions during the sample period. A second group of countries, where only weak evidence is found for a lending channel, includes France, Italy and Spain. The apparent absence of a bank lending channel in the rest of the countries in our sample suggests that the tendency towards increased market-based finance has strengthened the degree of asset substitutability. For countries like the US and the UK, where financial systems have been predominantly market-based for a relatively long time, the tests strongly rejected the hypothesis of an operative lending channel. Finally, heterogeneity in bank characteristics was found to be useful in accounting for loan supply shifts only in the case of France, suggesting that it represents a less important element on which the search for a bank lending channel could be based.

The narrative approach for the identification of monetary policy shocks in a small open economy

Working Paper No. 55
Eleni Angelopoulou

In this paper the narrative methodology, which uses policy record to identify the rationale behind policy actions, is applied to the UK in order to explore the transmission of monetary policy. The period studied ranges from 1971, when "Competition and Credit Control" was introduced, to 1992, when the UK abandoned the Exchange Rate Mechanism. This period, which was characterised by monetary control arrangements through intermediate targets, ends before the shift to direct inflation targeting, introduced in 1992 and still in place.

The effects of monetary policy are usually examined with the use of structural VAR models. This methodology is appealing because results in the form of impulse responses of variables to a policy shock provide many insights in an easily readable form. However, it comes at the cost of the imposition of disputable restrictions for the identification of policy shocks. The narrative approach aims to circumvent "statistical" identification problems faced by the structural VAR literature, while keeping the expositional framework. Identification of policy episodes relies exclusively on the study of monetary policy record. A policy dummy capturing systematic shifts of policy is constructed and an unrestricted VAR framework is used to estimate the effects of a policy shock on other variables.

This paper develops the narrative approach framework in three ways. The first is its extension to a small open economy, in contrast with existing studies which apply the narrative approach to the United States, i.e. a large closed economy whose monetary policy decisions are not guided by external goals.

The second contribution relates to the attempt to improve the narrative approach methodology by choosing a transparent definition of policy episodes, consisting of four clear and easily verifiable preconditions. The aim here is to deflect some of the usual criticism about the approach, namely that it is too judgmental.

Finally, the use of a step-dummy, instead of an impulse dummy, for monetary policy episodes is a technical improvement to the framework, which allows for the duration of an episode to be taken into account – central banks rarely enact a policy change in one go.

Restrictive monetary policy shocks (identified as shocks to the interest rate which are orthogonal to shocks to the systematic policy dummy) appear to give theory-consistent results (persistent fall in prices and money, hump-shaped response of output with a slow recovery pace). Monetary policy appears to cause substantial fluctuations in output at a four-year horizon. The exchange rate, which shows persistent appreciation in the aftermath of a policy shock, appears to be the major source of fluctuations in output at a four-year-horizon.

Foreign exchange intervention and equilibrium real exchange rates

Working Paper No. 56
Dimitrios Sideris

In this paper we examine the effects of official intervention on: (i) the short-run dynamics of nominal exchange rates and (ii) the estimated long-run behaviour of the real exchange rate (more precisely, the long-run behaviour of nominal exchange rates in relation to the behaviour of relative prices). Our main argument is that, by identifying and "isolating" the effects coming from intervention operations on the short-run exchange rate dynamics, we can detect a long-run equilibrium relationship connecting domestic and foreign prices to nominal exchange rates, as formed by market forces alone.

The paper presents empirical findings for the validity of the above argument by drawing on the experience of Bulgaria, Poland, Romania, Russia, Slovenia and Ukraine during the period following their transition to a market economy at the beginning of the 1990s. In the analysis, exchange rate data for the domestic currencies of the six economies against the US dollar are used. The six economies seem ideal candidates for evaluating the above argument as they share a number of common features: they all adopted flexible or managed floating exchange rate regimes, whereas their monetary authorities made frequent interventions in the foreign markets in order to smooth exchange rate volatility or pursue various monetary targets.

The results confirm our theoretical postulate: Effects due to authorities' interventions in the foreign market turn out to be significant for the dynamic behaviour of all nominal exchange rates under consideration. The results related to the behaviour of exchange rates and relative prices in equilibrium change dramatically once intervention effects are taken into account in the empirical modelling of the short-run dynamics and indicate that omission of intervention effects would lead to mistakenly rejecting a long-run exchange rate pattern based on Purchasing Power Parity (PPP). In other words, allowing for intervention effects, we indicate that PPP has enough content about the behaviour of the real exchange rates in equilibrium. In addition, the estimated equilibrium relationships indicate that the nominal exchange rates moved towards their equilibrium values in a constant pattern, which nevertheless implied a constant appreciation of the real exchange rates. This finding indicates the presence of strong Balassa-Samuelson effects which have been in place for long periods of time. Nevertheless, the stationarity of the real exchange rates is not accepted in five out of the six economies, and this may also be due to productivity shocks and the impact that productivity has on the pricing of traded and non-traded goods and services sectors.

The New Keynesian Phillips Curve and lagged inflation: a case of spurious correlation?

Working Paper No. 57
George Hondroyiannis, P.A.V.B. Swamy and George S. Tavlas

The New Keynesian Phillips Curve (NKPC) specifies a relationship between inflation and a forcing variable and the current period's expectation of future inflation. Most empirical estimates of the NKPC, typically based on Generalized Method of Moments (GMM) estimation, have found a significant role for lagged inflation, producing a "hybrid" NKPC. Using US quarterly data for the period 1970:1-2000:4, this paper examines whether the role of lagged inflation in the NKPC might be due to the spurious outcome of specification biases. In line with previous papers, we employ GMM estimation and we find a significant effect for lagged inflation.

We also use time varying coefficient (TVC) estimation, a procedure that allows us to directly confront specification biases and spurious relationships. Specifically, employing TVC estimation, each slope coefficient of both the pure and hybrid NKPCs is interpreted as the sum of three components: (i) a bias-free component, (ii) an omitted-variables bias component, and (iii) a measurement-error bias component. By separately identifying the bias-free component, we are able to distinguish between spurious and non-spurious regressions. If the bias-free component of the coefficient of a regressor is zero, then the coefficient is considered spurious even if the components representing the omitted-variables bias and measurement-error bias of the coefficient are non-zero.

TVC estimation has the advantage of taking structural changes into account. Unlike fixed-coefficient estimation, under which the dummy variable is added to the regression, in TVC estimation the dummy variable first appears as a coefficient driver. The coefficient driver can affect all the estimated coefficients of the NKPC and the hybrid Phillips curve and also affects the variances and covariances of the errors. Intuitively, the coefficient drivers, which may be thought of as variables, but not part of the explanatory variables of the NKPC, serve two purposes. First, they deal with the correlations between the included explanatory variables and their coefficients. Second, they allow us to decompose the coefficients of the TVC models into their respective components.

Under GMM, incorporating lagged inflation and, alternatively, one of three measures of expected inflation in the Phillips relation, the coefficients on the lagged inflation variable and expected inflation sum to near unity, yielding a long-run vertical Phillips relation. TVC estimation suggests that the role found by previous researchers for lagged inflation in the NKPC is the spurious outcome of specification biases. Moreover, our results are not dependent on a particular measure of inflation expectations. Each of the three measures used provided a similar set of results.

The interaction between mortgage financing and housing prices in Greece

Working Paper No. 58
Sophocles N. Brissimis and Thomas Vlassopoulos

The interaction of credit and property prices is of particular relevance to central bank policy. The financial accelerator mechanism which is part of the nexus of this interaction is central to the monetary policy transmission mechanism. Moreover, fluctuations in asset prices, and housing prices in particular, pose challenges to monetary policy makers in calibrating the appropriate response. Finally, this interaction can have important implications for financial stability.

The aim of this paper is to empirically investigate the pattern of causality between credit and property prices, focusing on housing loans and housing prices in the case of Greece. This is of particular interest given that the deregulation of mortgage lending in Greece, which was followed by a rapid increase in housing loans, went hand-in-hand with a continuous increase in housing prices that, in nominal terms, averaged 11% per annum between 1995 and 2005. This development raises the question whether the growth in residential property valuations was spurred by the increased availability of mortgage lending. Moreover, the issue of housing prices is of great importance in Greece, since residential property represents more than 80% of total household wealth, a share far greater than that in other comparable countries.

In order to analyse the interaction between housing loans and housing prices, multivariate cointegration techniques are employed in this paper. The results of the long-run analysis indicate that statistically housing prices are weakly exogenous and hence do not react to disequilibria in the mortgage lending market. This suggests that in the long run a line of causality running from housing loans to housing prices is not confirmed empirically. The short-run analysis, however, provides clear indications of a contemporaneous bi-directional dependence among housing loans and housing prices.

The absence of long-run causation running from housing loans to housing prices implies that other factors need to be examined in order to account for the developments in residential property valuations during the latter part of the sample period in Greece. These factors include: the improvement in households' expectations regarding their future income, related to some extent to the fact that Greece has joined the euro area; the reduction in interest rates, also partly related to the process of EMU accession; demographic factors, in particular the influx and gradual integration of immigrants as well as the reduction in the average size of households, as single-person households become more common; and, finally, the low or negative real returns offered by most financial assets during this period.

Home bias and Purchasing Power Parity: evidence from the G-7 countries

Working Paper No. 59
Dimitrios Sideris

Home bias is associated either with international trade costs in goods markets – costs which may include transportation and information costs, border costs such as tariffs and non-tariff barriers and other trade impeding factors – or with the behaviour of consumers, who are presumed to differentiate their spending between domestic goods and their imported substitutes. Some recent studies in the international economics literature emphasise the role of home bias in explaining a number of empirical puzzles in international macroeconomics, one of which is the inability to detect Purchasing Power Parity (PPP) in the long run.

In the present paper, we empirically investigate the influence of home bias on the long-run relationship between nominal exchange rates and relative prices as formed in the goods markets and which should express a PPP-type relationship. In particular, we test the following hypotheses: (i) That there exists a home bias effect that influences the relationship between nominal exchange rates, and domestic and foreign prices, and that this effect diminishes over time as trade costs decrease (as a result of diminishing transportation costs and the abolition of a number of tariffs), owing to the increased integration of traded goods markets and the growing similarity of consumption patterns across developed countries. (ii) That incorporating the time pattern of home bias into the empirical specification of PPP enhances the robustness of the theory.

The hypotheses are tested for the US economy vis-à-vis the rest of the G-7 economies (Germany, Japan, France, Italy, Canada and the UK) for the post-Bretton Woods period 1973:1-2006:1. Quarterly observations on exchange rates and price indices are used in the analysis. The form of the long-run relationship of interest, which could express a PPP relationship, is investigated using panel cointegration techniques.

The empirical findings support both tested hypotheses: Home bias is shown to exert a low, but significantly negative effect on the relative price-exchange rate relationship, a result that indicates that there exists a home bias effect which is marginally falling over time. In addition, when the time pattern of the home bias effect is accounted for in the empirical modelling, we are able to accept long-run PPP in both the weak and the strong form.

Short-term capital flows and growth in developed and emerging markets

Working Paper No. 60
Pavlos Petroulas

Much attention has focused on recent financial crises around the world. Empirical studies of these crises have found that short-term capital inflows increase a country's financial fragility, as well as the likelihood of a financial crisis. As a rule, financial crises are neither rare nor isolated incidents in financial markets. They seem to pop up every decade or so, as do the models that try to explain them.

Two recent theoretical models, by Chang and Velasco (2000) and Aghion *et al*. (2004), form the basis for our empirical investigation. While the two models have quite a different setup, they share certain similarities. Firstly, financial market problems seem to be a problem for emerging markets and not developed ones. Secondly, the problems for emerging markets arise from reversals in capital flows. Thirdly, in both models, the reversal comes from capital which is deemed short-term. While short-term capital flows as such do not pose any intrinsic threat to an economy and while some short-term capital is essential for any economy to run, there are some good arguments for thinking that such flows may not only provide benefits.

Following certain theoretical predictions, we construct a volatility measure for short-term capital flows which is expressed either as a share of reserves and/or as a share of GDP in order to conform to the theoretical models. This measure is incorporated in growth regressions for a panel of countries for the years 1970-2000.

The results of this macro-oriented approach show that, while large and volatile short-term flows have no effect on growth in rich countries, they are growth-inhibiting in emerging markets. These results are robust to a large variety of estimation methods and pass stringent extreme bound analysis criteria. Moreover, their magnitude proves to be of economic importance. More specifically, a one standard deviation increase in the short-term volatility of capital flows decreases growth by around one percentage point per year. The analysis indicates that opening up emerging markets' capital accounts, which implies increased short-term capital flows, is not a clear-cut way to prosperity.

Monetary policy and financial system supervision measures

(January - September 2007)

Monetary policy measures of the Eurosystem

11 January, 8 February 2007

The Governing Council of the ECB decides that the minimum bid rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility will remain unchanged at 3.50%, 4.50% and 2.50% respectively.

8 March 2007

The Governing Council of the ECB decides, with effect from 14 March 2007, to increase:

1. the minimum bid rate on the main refinancing operations by 25 basis points to 3.75%;

2. the interest rate on the marginal lending facility by 25 basis points to 4.75%; and

3. the interest rate on the deposit facility by 25 basis points to 2.75%.

12 April, 10 May 2007

The Governing Council of the ECB decides that the minimum bid rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility will remain unchanged at 3.75%, 4.75% and 2.75% respectively.

6 June 2007

The Governing Council of the ECB decides, with effect from 13 June 2007, to increase:

1. the minimum bid rate on the main refinancing operations by 25 basis points to 4%;

2. the interest rate on the marginal lending facility by 25 basis points to 5%; and

3. the interest rate on the deposit facility by 25 basis points to 3%.

5 July, 2 August, 6 September 2007
The Governing Council of the ECB decides that the minimum bid rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility will remain unchanged at 4%, 5% and 3% respectively.

9, 10, 13, 14, 20, 22, 27 August, 3 and 6 September 2007
The Governing Council of the ECB decides to conduct additional liquidity-providing operations for the normalisation of the functioning of the euro money market.

Bank of Greece decisions on the establishment and operation of credit institutions and the supervision of the financial system

1 January 2007
The Greek branch of the Italy-based bank "Sanpaolo IMI S.p.A." changes its registered name to "Intesa Sanpaolo S.p.A.".

24 January 2007
— "Piraeus Bank" is authorised to increase its qualifying holding in the share capital of the Belgrade-based "Piraeus Bank AD, Beograd".

— "Proton Bank S.A." is authorised to increase its qualifying holding in the share capital of the Cyprus-based "Interfund Investments Ltd".

1 February 2007
The branch of the Poland-based "DaimlerChrysler Bank Polska SA" commences its operation in Greece.

13 February 2007
The Greek branch of "Société Générale", which is under liquidation, is authorised to prolong its administrative, accounting and tax-related operations.

20 February 2007
The framework for the processing and re-circulation of euro banknotes by credit institutions and professional cash handlers is determined.

1 March 2007
— "EFG Eurobank Ergasias SA" is authorised to increase its qualifying holding in the share capital of its Serbia-based subsidiary "Eurobank EFG Stedionica AD Beograd".

— "EFG Eurobank Ergasias SA" is authorised to establish a new branch in Cyprus.

— "Alpha Bank SA" is authorised to acquire: (i) a direct qualifying holding in the share capital of a holding company under establishment and (ii) an indirect qualifying holding in the share capital of the Turkey-based "Alternatif Bank AS" and of the companies "Alternatif Financial Kiralama AS", "Alternatif Yatirim AS" and "Alternatif Yatirim Orkaligi AS".

— The Russia-based "Kedr Close Joint Stock Company Commercial Bank" is authorised to establish and operate a branch in Greece.

9 March 2007
"Piraeus Bank SA" is authorised to acquire a qualifying holding in the share capital of the insurance company "Europaiki Pisti AEGA".

2 April 2007
— It is stipulated that the previously granted authorisation of a financial leasing company concerns the already operating company "Piraeus Coastal Transportation Services SA", to be renamed "Piraeus Leasing SA".

— "EFG Eurobank Ergasias SA" is authorised to increase its indirect qualifying holding in the share capital of the Belgrade-based "Prospera Securities AD Beograd".

— "Piraeus Bank SA" is authorised to acquire 100% of the share capital of its Sofia-based subsidiary "Piraeus Bank Bulgaria AD".
— "Alpha Bank SA" is authorised to establish six new branches in Albania.

3 May 2007
The authorisation of "Famanet Hellas SA Financial Information Services" is revoked.

4 May 2007
An amendment is made to Annex 4 of Bank of Greece Governor's Act 2577/9 March 2006, which specifies the basic principles and criteria for the evaluation of the organisational structure of credit institutions' Internal Audit Systems, in relation to the prevention of money-laundering and terrorist financing.

16 May 2007
Banking and Credit Committee Decision 178/3/2004 on the collection of management fees related to savings deposit accounts is supplemented.

30 May 2007
The change in the name of "Laiki Factoring SA" to "Marfin Factors & Forfaiters SA" is approved.

8 June 2007
— The merger of "Investment Bank of Greece SA" with "Egnatia Finance Investment Services SA" by absorption of the latter by the former is approved.

— The merger of "Egnatia Bank SA", "Laiki Bank (Hellas) SA" and "Marfin Bank SA" by absorption of the latter two by the first one is approved.

— A specific shareholder is authorised to increase his qualifying holding in the share capital of "Aegean Baltic Bank SA".

— The merger of "Egnatia Leasing SA" and "Laiki Leasing SA" by absorption of the latter by the former is approved.

28 June 2007
— The amendment to the Statute of "Egnatia Bank SA", relating to the change of its name to "Marfin Egnatia Bank SA", is approved.

— Turkey-based "TC Ziraat Bankasi AS" is authorised to establish and operate a branch in Greece.

24 July 2007
— The merger of "National Bank of Greece SA" with "National Management and Organisation SA" by absorption of the latter by the former is approved.

— "National Bank of Greece SA" is authorised to establish twelve new branches in Albania.

— "National Bank of Greece SA" is authorised to acquire a qualifying holding in the share capital of the Cayman Islands-based company under establishment "Portfolio Investment Company Limited".

— "EFG Eurobank Ergasias SA" is authorised to acquire an indirect qualifying holding in the share capital of the Romania-based company under establishment "Bancpost Fond de Pensii SA".

— "Cooperative Bank of Trikala Ltd." is authorised to change its name to "Cooperative Bank of Thessalia Ltd.".

20 August 2007

Ten Bank of Greece Governor's Acts are issued on the transposition of Directives 2006/48/EC and 2006/49/EC concerning the capital adequacy of credit institutions and the control of their large exposures. Specifically, these Acts concern:

- the definition of own funds of credit institutions based in Greece,
- the calculation of capital requirements for credit risk according to the standardised approach,
- the calculation of capital requirements for credit risk according to the internal ratings based approach,
- credit institutions' minimum capital requirements for operational risk,
- the calculation of credit institutions' capital requirements for market risk,
- the credit institutions' disclosure of data and information on their capital adequacy, the risks they assume and the management thereof,
- the calculation of weighted exposures for securitisation positions,
- the counterparty risk,
- the establishment of the criteria that must govern the credit institutions' Internal Capital Adequacy Assessment Process (ICAAP) and the Supervisory Review Process (SRP) by the Bank of Greece,
- the supervision and control of credit institutions' large financing exposures.

28 August 2007

— Provision of sanctions against issuers of uncovered cheques is suspended in the context of implementation of general favourable arrangements for residents of fire-stricken areas.

— "Egnatia Leasing SA" is authorised to change its name to "Marfin Leasing SA".

13 September 2007

— The merger of "Attica Bank SA" with "Attica Leasing SA" by absorption of the latter by the former is approved.

— "Piraeus Bank SA" is authorised to acquire a qualifying holding in the share capital of a Cyprus-based credit institution under establishment.

25 September 2007

— "Alpha Bank" is authorised to acquire 100% of the share capital of the company under establishment "AlphaLife Insurance Company SA".

— Moody's Investors Service, Standard & Poor's Ratings Services and Fitch Ratings are recognised as eligible External Credit Assessment Institutions (ECAIs), in order for credit institutions to use the credit assessment of these entities for calculating capital requirements.

28 September 2007

The branch of Italy-based "Banca IMI" commences its operation in Greece.

Decisions of the Bank of Greece

Issuance of ten Bank of Greece Governor's Acts for the transposition to domestic law of the provisions of Directives 2006/48/EC and 2006/49/EC on the capital adequacy of credit institutions and the control of their large financing exposures

Bank of Greece Governor's Acts 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595 and 2596/20 August 2007 complete the transposition to Greek law of the provisions of Directives 2006/48/EC and 2006/49/EC concerning the capital adequacy of credit institutions and investment firms. This new framework, known as "Basel II", establishes the following three fundamental axes of supervision (Pillars):

- Pillar 1 establishes new methods for calculating capital requirements for the credit risk banks typically face in pursuing their activities and introduces capital requirements for operational risk.

- Pillar 2 lays down the principles, procedures and criteria whereby credit institutions and then the supervisory authority (the Bank of Greece) assess the capital adequacy and the soundness of the risk management system of each credit institution, in relation to all kinds of risks to which it is or may be exposed in addition to those addressed under Pillar 1.

- Pillar 3 establishes disclosure requirements with a view to enhancing transparency and market discipline by allowing the parties concerned to compare both the credit institutions' risk management policies and capital and organisational adequacy (thus offering incentives for improvement), and the supervisory authorities' methods and practices.

- Already, Law 3601/2007 transposed to Greek law the general provisions of the above Directives, while at the same time it replaced and revised earlier banking legislation (Laws 5076/1931, 1665/1951 and 2076/1992; Presidential Decree 267/1995), taking into account market developments and the experience gained so far. Moreover, the consolidation of all related provisions into a single law enhances legal certainty, facilitating the task of both supervised institutions and supervisory authorities.

- By authority of the aforementioned law, the following Bank of Greece Governor's Acts transposed to domestic law the specialised provisions of the above Directives that concern credit institutions. These Acts are:

Pillar 1

1. Act 2588/20 August 2007: calculation of capital requirements for credit risk according to the Standardised Approach

This Act establishes the method for calculating capital requirements for credit risk by the Standardised Approach, which is the simpler one of the new alternative relevant approaches and improves the earlier framework by establishing a more proportionate correlation between own funds and risk assumed, as it:

(a) Enlarges the scale of the weights assigned to each category of bank financing or other bank exposure.

(b) Takes into account additional parameters, such as the borrower's credit assessment by recognised External Credit Assessment Institutions (ECAIs); risk dispersion, which allows a reduction from 100% to 75% of the risk weight assigned to loans of up to €1 million to natural persons or small– and medium-sized enterprises; the existence of real estate collateral, which allows a reduction from 50% to 35% of the risk weight assigned to the loans, while, in contrast, a repayment delay of more than 90 days leads to an increased weight; etc.

(c) Recognises other types of collateral as well, plus more advanced techniques for credit risk mitigation, such as credit derivatives.

2. Act 2589/20 August 2007: calculation of capital requirements for credit risk according to the Internal Ratings Based Approach

Lays down the Internal Ratings Based Approach (IRB Approach), which introduces a completely new methodology for the calculation of capital requirements, based on risk parameters such as the borrower's probability of default and the credit institution's loss given default, allowing for the first time credit institutions to use their own internal management systems and models in estimating these parameters.

Employment of the above approach and its improved version (the advanced IRB Approach) is subject to approval by the Bank of Greece, or, in case of a subsidiary bank based in the European Union, by the supervisory authority of the country in which the parent bank is based, following a consultation in which the Bank of Greece participates. Approval is granted upon ascertained fulfilment of certain requirements with reference to the adequacy of the internal systems having been devel-

oped by the bank for rating borrowers and loans, quantifying risk parameters, confirming the relevant results and utilising them in the decision-making process as regards the granting and pricing of loans.

3. Act 2593/20 August 2007: calculation of weighted exposures for securitisation positions

Determines the alternative methods for the calculation of the banks' capital requirements in relation to their exposures associated with securitisations, with a view to ensuring that credit institutions hold adequate funds to cover the risks to which they are or may be exposed within the scope of the technique in question.

4. Act 2591/20 August 2007: calculation of credit institutions' capital requirements for market risk

Imposes adjustments in the calculation of capital requirements for market risk, i.e. the risk resulting from any volatility of interest rates or exchange rates, or prices of debt securities, commodities tradable in regulated markets, etc. Most important among these adjustments are those related to the additional risk factors each bank must take into account in order to apply its own models for calculating its capital requirements.

5. Act 2594/20 August 2007: counterparty risk

Provides to credit institutions the additional possibility of using new advanced methods for calculating the value of their exposures, particularly from repurchase type transactions (repos) and derivative contracts, with a view to calculating their capital requirements for counterparty risk. This risk relates to the credit institution's loss in case of counterparty default, also taking into account any volatility of the market values of the financial instruments involved in the transaction.

6. Act 2590/20 August 2007: credit institutions' minimum capital requirements for operational risk

The establishment of capital requirements for operational risk constitutes a major innovation of the new framework. The notion of this risk relates to potential losses resulting from inadequate or failed internal processes or people, and also covers legal risk. This Act also enables credit institutions to select between standardised and advanced approaches for the calculation of capital requirements for this risk.

Pillar 2

7. Act 2595/20 August 2007: establishment of the criteria that must govern the credit institutions' Internal Capital Adequacy Assessment Process (ICAAP) and the Supervisory Review Process (SRP) by the Bank of Greece

This Act establishes, in addition to the provisions under Pillar 1:

(a) Qualitative criteria for the calculation of each credit institution's capital adequacy, depending on its particular characteristics.

(b) The notion of "internal capital", which is broader than that of "supervisory capital" as calculated following the methods of Pillar 1, since internal capital relates to funds that the credit institution must maintain in adequacy in terms

of quantity, quality and distribution for addressing the various risks to which it is or may be exposed, including but not limited to those not covered or adequately addressed within the framework of Pillar 1, such as concentration risk, strategy risk, goodwill risk, as well as exogenous risks stemming from the institutional, economic or business environment.

(c) The process of supervisory assessment by the Bank of Greece of the credit institution's overall compliance with its obligations, which will be the subject of a dialogue with the credit institution aimed at a mutual understanding of the applied methods and procedures and the timely remedy of their weaknesses. Within this framework, the Bank of Greece may either take the supervisory measures provided for by Law 3601/2007, which include the establishment of additional provisions, or impose additional capital requirements in case it deems the relevant corrective measures inadequate to address the risks. The individual matters of the relevant procedure, which, as regards its extent and frequency, will be applied according to the principle of proportionality, will be further specified within the framework of the consultations of the Bank of Greece with credit institutions.

Pillar 3

8. Act 2592/20 August 2007: credit institutions' disclosure of data and information on their capital adequacy, the risks they assume and the management thereof

Establishes the general criteria and obligations regarding the disclosure by credit institutions of information related mainly to:

(a) the businesses of the credit institution's group (as defined for supervisory and accounting purposes);

(b) the credit institution's own funds and its capital adequacy calculation method; and

(c) its exposure to each risk category, including the strategic goals, assessment methods and mitigation techniques related to these risks.

It also establishes the frequency, method and means of information disclosure and verification. As a rule, the relevant data will be published at least annually on the credit institution's website.

Other Acts

9. Act 2587/20 August 2007: definition of own funds of credit institutions based in Greece

This Act:

(a) Adjusts the framework currently in force to the provisions of Directives 2006/48/EC and 2006/49/EC as regards the items and the composition of the credit institutions' own funds taken into account in the calculation of their capital adequacy, and

(b) codifies the relevant earlier provisions, including those related to the recognition of hybrids as items of the banks' own funds, as well as to the deduction from the credit institutions' own funds of equity participations and loans granted for the purchase of its own shares, so as to avoid "double gearing" in the calculation of own funds.

10. Act 2596/20 August 2007: supervision and control of credit institutions' large financing exposures

This Act adjusts and codifies in a single text the provisions currently in force regarding the control of large financing exposures. The main adjustments relate to:

(a) the recognition of collateral items that reduce the level of the large financing exposures, correspondingly to the provisions of the previously mentioned Bank of Greece Governor's Acts related to credit risk and market risk; and

(b) the establishment of a separate limit for the bank's total financing exposures to its major shareholders and any individuals or enterprises associated thereto.

The new institutional framework is expected to decisively affect the shaping of the financial system, the development of banks, and the way supervision will be carried out in the coming years, given that it:

(a) Takes into account the particularities of each credit institution as regards its size, business scale and scope of activities, providing it with the possibility of selecting, for the calculation of its capital requirements, between alternative methods of different levels of sophistication and sensitivity as regards the risks assumed, so that the minimum capital requirements become more proportionate to those risks.

(b) Encourages credit institutions to progressively adopt the more advanced approaches, a fact that signals the transition to a supervisory framework not governed by inelastic, administratively predetermined supervisory rules, but based mainly on qualitative criteria and assessments. Nevertheless, conclusion of this development will depend on the banks' pace of adjustment.

(c) Adopts the guidelines issued by the Committee of European Banking Supervision (CEBS), which aim at a convergence of supervisory practices at European level for purposes of competition and more efficient supervision, mainly of groups with cross-border activities, while at the same time they lead to a reduction of the supervision's administrative costs. Moreover, adopting supervisory criteria compliant with the best international practices is an objective towards which the Bank of Greece remains steadily oriented.

Statistical section

Tables

Table I.1

Consumer price index

(Percentage changes over the corresponding period of the previous year)

Period	General index	General index excluding food and fuel	General index excluding fresh fruit/vegetables and fuel	Goods	Services	Sub-indices		
						Food and non-alcoholic beverages	Fresh fruit and vegetables	Fuel
2003	3.5	3.1	3.2	3.1	4.2	5.0	10.7	3.9
2004	2.9	3.2	3.3	2.3	3.8	0.5	–11.9	7.5
2005	3.5	3.2	3.1	3.4	3.7	0.6	–8.1	18.0
2006	3.2	2.5	2.7	3.4	3.0	3.7	3.3	10.9
2006 I	3.3	2.3	2.5	3.3	3.2	1.9	–5.8	19.6
II	3.2	2.3	2.5	3.6	2.7	3.4	1.3	14.8
III	3.4	2.4	2.7	3.9	2.8	5.1	10.8	11.8
IV	2.9	2.8	3.0	2.7	3.1	4.6	9.4	–1.2
2007 I	2.7	3.3	3.2	2.1	3.4	3.1	4.9	–4.9
II	2.6	3.1	2.9	1.9	3.6	2.0	2.9	–1.5
2005 Jan.	4.0	4.5	4.2	4.3	3.7	0.6	–8.9	10.3
Feb.	3.1	3.2	3.0	2.8	3.6	–0.9	–12.1	16.4
March . .	2.9	2.9	2.7	2.4	3.6	–1.3	–13.1	18.4
April	3.4	3.1	3.0	3.1	3.8	–0.1	–11.0	19.7
May	3.2	3.3	3.2	2.7	4.0	–0.4	–12.3	14.9
June	3.3	3.0	3.0	3.1	3.7	–0.5	–14.1	19.9
July	3.9	3.5	3.3	4.1	3.7	0.7	–7.9	20.0
Aug.	3.7	3.0	2.9	3.8	3.6	1.4	–3.7	20.8
Sept.	3.9	2.9	2.8	4.2	3.6	2.0	–0.7	24.0
Oct.	3.8	3.1	3.0	3.8	3.9	2.7	2.1	17.1
Nov.	3.5	3.0	3.0	3.4	3.7	2.6	1.2	12.5
Dec.	3.6	2.9	2.9	3.7	3.5	1.0	–8.9	22.1
2006 Jan.	3.2	2.0	2.3	3.3	3.2	1.6	–6.3	24.9
Feb.	3.2	2.3	2.5	3.3	3.2	2.0	–4.5	19.2
March . .	3.3	2.6	2.9	3.3	3.3	2.1	–6.7	15.1
April	3.3	2.3	2.6	3.6	2.9	3.8	3.5	14.0
May	3.1	2.1	2.4	3.6	2.6	2.9	–0.7	16.6
June	3.2	2.3	2.6	3.6	2.7	3.5	0.9	13.8
July	3.8	2.3	2.6	4.6	2.7	5.8	15.9	17.3
Aug.	3.5	2.4	2.7	3.9	2.9	4.7	7.5	14.4
Sept.	2.9	2.5	2.7	3.0	2.8	4.7	9.4	4.0
Oct.	2.8	2.8	3.0	2.7	3.0	5.1	10.1	–2.4
Nov.	2.9	2.8	3.0	2.8	3.2	4.5	8.6	–0.6
Dec.	2.9	2.9	3.0	2.7	3.2	4.3	9.5	–0.6
2007 Jan.	2.7	3.1	3.1	2.3	3.3	4.4	11.4	–6.4
Feb.	2.7	3.5	3.3	2.0	3.4	2.3	–0.4	–4.7
March . .	2.6	3.2	3.1	2.1	3.4	2.7	4.2	–3.6
April	2.5	3.2	3.0	1.8	3.5	1.7	–0.2	–2.6
May	2.6	3.1	2.9	1.9	3.6	2.0	2.9	–1.1
June	2.6	3.0	2.8	1.9	3.6	2.3	6.7	–0.7
July	2.5	3.2	2.9	1.6	3.7	2.7	9.0	–4.7
Aug.	2.5	3.1	2.9	1.7	3.6	3.3	13.0	–5.8
Sept.	2.9	2.8	2.7	2.6	3.4	3.9	13.3	1.6

Source: Calculations based on National Statistical Service of Greece (NSSG) data (CPI 2005=100).

Table I.2

Industrial producer price index (PPI) for the domestic and the external market

(Percentage changes over the corresponding period of the previous year)

Period	PPI in industry for the domestic market									PPI in industry for the external market	
				Consumer goods			Energy				
	General index	Inter-mediate goods	Capital goods	Total	Durables	Non-durables	Total	Fuel (oil refinery products)	General index excl. energy	General index	General index excl. energy
2003	2.3	2.3	1.6	2.7	1.0	2.8	1.8	–1.8	2.5	–0.3	–0.6
2004	3.5	3.2	4.5	6.0	2.0	6.2	4.0	4.3	4.7	5.0	1.8
2005	5.9	3.8	2.6	2.5	4.2	2.4	13.2	25.1	3.0	3.7	0.3
2006	6.9	7.5	2.3	5.9	3.5	6.0	8.1	12.9	6.3	4.2	2.7
2006 I	9.2	4.7	1.5	8.8	3.8	9.0	15.4	30.0	6.8	7.0	2.7
II	8.6	7.6	1.7	7.4	3.4	7.6	12.0	21.6	7.2	5.9	2.9
III	6.8	9.2	3.1	6.2	3.6	6.3	6.1	8.1	7.2	3.2	2.7
IV	3.0	8.6	2.7	1.6	3.2	1.5	0.0	–3.6	4.3	0.8	2.3
2007 I	0.7	6.8	4.8	–2.2	4.6	–2.5	–1.4	–6.9	1.6	–0.8	1.6
II	1.9	6.2	6.3	–2.0	4.2	–2.3	2.4	–1.1	1.6	0.9	2.0
2005 Jan.	3.9	5.3	5.8	0.7	3.3	0.6	7.1	12.5	2.7	2.0	0.1
Feb. . . .	4.6	4.7	5.0	0.8	3.6	0.7	10.0	19.8	2.5	2.9	0.2
March . .	5.3	4.7	3.8	0.9	3.6	0.8	12.6	24.6	2.5	3.1	–0.3
April . . .	5.1	3.8	2.7	1.0	4.3	0.9	12.8	24.9	2.2	2.4	–0.9
May . . .	3.7	3.4	2.3	1.3	4.6	1.1	7.8	13.2	2.1	1.2	–0.6
June . . .	5.7	3.5	1.7	1.8	4.7	1.7	14.3	28.0	2.4	3.3	–0.2
July	5.6	3.5	0.5	1.8	4.7	1.7	13.9	26.9	2.4	3.9	0.2
Aug. . . .	6.0	3.2	1.4	2.1	4.7	2.0	14.9	28.3	2.5	4.4	0.5
Sept. . . .	7.3	3.2	1.3	2.8	5.1	2.7	18.6	34.0	2.8	5.2	0.6
Oct. . . .	7.0	2.9	2.1	4.9	4.4	4.9	14.5	24.3	4.0	4.4	0.8
Nov. . . .	7.0	3.5	2.5	5.1	3.6	5.2	13.6	26.1	4.3	5.3	1.3
Dec. . . .	9.1	4.1	2.5	7.1	3.6	7.2	17.9	36.9	5.7	6.5	1.9
2006 Jan.	9.9	4.3	2.2	9.1	3.4	9.4	17.8	36.2	6.9	7.5	2.5
Feb. . . .	9.5	5.0	1.4	8.7	3.8	8.9	16.2	32.0	6.8	7.2	2.7
March . .	8.3	4.9	0.8	8.5	4.1	8.7	12.3	22.7	6.6	6.4	3.0
April . . .	8.6	6.1	0.7	8.3	3.6	8.5	12.4	22.5	7.0	6.3	3.1
May . . .	9.3	7.9	1.9	7.4	3.2	7.6	14.0	25.9	7.3	6.2	2.8
June . . .	8.0	8.9	2.6	6.5	3.4	6.6	9.7	16.7	7.2	5.2	2.7
July	8.3	9.0	3.2	6.6	3.4	6.8	10.6	18.2	7.3	4.3	2.4
Aug. . . .	7.7	9.3	3.2	6.5	3.9	6.7	8.2	10.9	7.4	4.2	3.0
Sept. . . .	4.5	9.2	3.1	5.5	3.4	5.6	–0.3	–3.8	6.8	1.0	2.9
Oct. . . .	3.0	9.7	2.8	2.6	3.4	2.5	–2.1	–7.4	5.3	0.6	2.8
Nov. . . .	3.4	8.4	2.6	1.6	3.2	1.5	1.3	–1.2	4.3	0.8	2.5
Dec. . . .	2.7	7.8	2.6	0.6	3.0	0.5	1.0	–1.9	3.4	0.9	1.7
2007 Jan.	0.4	7.4	3.1	–2.0	4.7	–2.3	–2.7	–9.4	1.8	–1.3	1.7
Feb. . . .	0.6	6.6	5.1	–2.4	4.7	–2.7	–1.4	–6.8	1.4	–0.6	1.5
March . .	1.1	6.6	6.2	–2.1	4.4	–2.4	–0.2	–4.6	1.7	–0.5	1.7
April . . .	1.7	7.5	7.1	–2.4	4.2	–2.6	1.1	–3.6	1.9	0.7	2.1
May . . .	1.9	6.1	6.4	–2.0	4.4	–2.3	2.6	–0.7	1.6	0.8	1.8
June . . .	2.0	5.1	5.3	–1.6	4.1	–1.9	3.4	1.1	1.4	1.1	2.0
July	1.7	5.7	4.9	–1.7	4.1	–2.0	2.2	–1.1	1.5	1.2	2.1
Aug. . . .	1.7	6.2	4.6	–1.7	3.6	–2.0	1.8	–0.5	1.7	–0.2	1.4

Source: Calculations based on NSSG data.

Table I.3

Import price index in industry

(Percentage changes over the corresponding period of the previous year)

Period	Import price index in industry								
				Consumer goods			Energy*		
	General index	Intermediate goods	Capital goods	Total	Durables	Non-durables	Total	Crude oil and gas pumping	General index excl. energy
2003	0.7	–1.1	0.8	0.9	–1.4	1.4	11.0	. . .	0.6
2004	3.1	4.4	–0.1	0.6	–1.1	1.0	40.7	. . .	0.8
2005	8.8	2.7	–0.3	1.4	–0.8	1.9	51.2	57.1	1.2
2006	4.4	5.7	0.6	2.0	0.4	2.3	10.5	10.8	2.8
2006 I	7.7	2.5	0.7	2.3	0.5	2.7	33.1	35.0	1.8
II	6.8	5.1	0.9	2.1	0.7	2.4	23.1	23.9	2.7
III	2.7	7.0	0.6	1.8	0.4	2.1	1.3	0.9	3.1
IV	0.7	8.2	0.3	1.7	0.0	2.1	–8.4	–8.8	3.4
2007 I	–0.4	8.5	0.7	1.4	0.0	1.7	–13.4	–14.0	3.5
II	1.2	7.3	1.2	1.4	0.2	1.7	–5.8	–6.2	3.3
2005 Jan. . . .	6.6	4.7	–0.6	0.4	–1.3	0.8	40.0	44.5	1.4
Feb. . . .	9.0	4.3	–1.0	1.4	–1.1	1.9	59.9	67.9	1.5
March . .	9.1	3.7	–0.6	1.2	–1.0	1.7	58.0	65.2	1.4
April . . .	8.4	2.8	–0.6	1.0	–1.2	1.5	53.8	60.2	1.1
May . . .	6.5	2.3	–0.6	1.1	–1.2	1.6	39.1	43.7	0.9
June . . .	10.3	2.5	–0.3	1.5	–1.1	2.1	63.9	72.5	1.2
July	10.3	2.2	–0.4	1.6	–1.0	2.2	60.8	68.4	1.1
Aug. . . .	10.7	1.9	–0.3	1.7	–0.7	2.2	61.6	68.7	1.1
Sept. . . .	8.5	2.1	–0.1	1.6	–0.5	2.0	44.8	49.0	1.2
Oct. . . .	7.9	1.9	–0.1	1.6	–0.7	2.0	39.4	43.0	1.1
Nov. . . .	9.1	2.1	0.3	1.8	–0.2	2.3	46.6	51.9	1.4
Dec. . . .	9.8	2.0	0.5	2.2	0.6	2.6	51.4	56.0	1.6
2006 Jan. . . .	8.8	2.0	0.3	2.8	0.5	3.3	42.2	45.1	1.7
Feb. . . .	7.4	2.6	0.8	2.0	0.5	2.3	31.6	33.1	1.8
March . .	6.8	3.0	0.9	2.0	0.4	2.3	26.6	28.1	2.0
April . . .	7.4	3.9	1.1	2.1	0.5	2.5	28.2	29.7	2.4
May . . .	8.1	5.3	0.9	2.1	0.8	2.4	30.3	31.7	2.7
June . . .	5.0	6.2	0.8	2.1	0.7	2.4	12.3	12.1	3.0
July	3.8	6.6	0.7	1.9	0.8	2.2	6.5	5.6	3.0
Aug. . . .	2.3	7.3	0.7	1.8	0.5	2.1	–1.1	–2.2	3.3
Sept. . . .	2.1	7.1	0.4	1.7	0.0	2.1	–1.2	–0.6	3.1
Oct. . . .	1.2	7.9	0.2	1.8	0.0	2.2	–5.9	–5.7	3.3
Nov. . . .	0.6	8.3	0.3	1.6	–0.1	2.0	–8.8	–9.3	3.4
Dec. . . .	0.2	8.4	0.3	1.6	–0.1	2.0	–10.6	–11.3	3.4
2007 Jan. . . .	–1.0	8.9	0.5	1.3	0.0	1.6	–16.3	–16.8	3.6
Feb. . . .	–0.4	8.3	0.6	1.3	0.0	1.5	–13.2	–13.9	3.4
March . .	0.3	8.3	1.0	1.5	0.1	1.8	–10.7	–11.3	3.6
April . . .	0.8	8.0	0.8	1.3	0.1	1.6	–7.6	–8.1	3.4
May . . .	1.3	7.3	1.2	1.5	0.2	1.8	–5.6	–6.0	3.4
June . . .	1.5	6.8	1.4	1.4	0.3	1.7	–4.2	–4.5	3.3
July	2.6	6.8	1.4	1.4	0.0	1.7	0.6	1.0	3.3
Aug. . . .	2.6	5.8	1.4	1.6	0.1	1.9	1.4	2.3	3.0

* "Energy" data for 2004 are not comparable with those for 2003 because of changes in the relevant index coverage, which prior to 2004 did not include "carbon and lignite mining", "crude oil and gas pumping" and "electricity".

Source: Calculations based on NSSG data.

Table I.4

Industrial production index (2000=100)

(Percentage changes over the corresponding period of the previous year)

Period	Industry								
					Main categories of goods				
	General index	Manufac-turing	Mining - quarrying	Electricity - gas - water supply	Energy	Intermedi-ate goods	Capital goods	Consumer durables	Consumer non-durables
2003	0.3	–0.4	–5.2	5.8	2.9	–0.4	0.8	–3.6	–1.4
2004	1.2	1.2	0.3	1.4	0.3	1.0	–0.5	1.8	2.7
2005	–0.9	–0.8	–6.2	0.6	0.6	–1.7	–5.1	11.4	–0.9
2006	0.5	0.8	–2.2	0.1	1.3	0.7	1.3	2.0	–1.0
2005 III	–0.6	–0.8	–1.1	0.1	1.4	–1.9	–10.0	6.3	0.7
IV	1.3	2.3	–1.0	–1.8	4.2	–0.3	–0.3	21.5	–0.7
2006 I	0.9	0.9	–0.5	1.5	3.6	1.1	–6.2	2.0	–0.2
II.	0.4	1.1	–4.0	–0.9	3.1	0.0	4.0	–4.6	–2.3
III	0.0	0.2	1.1	–1.0	–0.6	2.7	0.2	6.3	–2.4
IV	0.6	1.0	–5.2	1.0	–0.6	–0.7	6.2	5.0	1.4
2007 I	2.9	3.4	6.1	0.2	–0.9	5.7	–0.3	3.3	5.3
II.	0.7	0.2	–5.7	5.4	3.4	–2.5	–2.1	2.0	2.5
2004 July	2.3	2.8	3.9	0.0	0.0	1.3	7.9	12.2	3.5
Aug.	0.5	2.2	–13.8	–0.4	–3.1	–3.6	–4.7	6.5	9.4
Sept.	–0.2	–0.4	–7.3	3.8	1.7	–0.1	–8.4	–8.1	1.1
Oct.	–3.7	–5.1	–2.2	1.9	–3.5	–3.4	–8.3	–13.8	–2.2
Nov.	2.1	2.3	–9.1	5.6	1.8	1.4	1.7	–14.7	4.8
Dec.	–0.5	–0.8	–11.7	4.3	1.4	1.2	–12.1	–8.9	0.8
2005 Jan.	0.4	0.3	–5.1	2.2	1.4	3.7	–8.9	26.0	–3.2
Feb.	1.3	3.2	–9.8	–2.6	–4.7	0.6	21.6	19.0	2.3
March	–5.5	–6.0	–19.6	2.2	–3.5	–5.6	–12.1	–1.7	–5.4
April	–3.2	–3.7	–14.1	3.9	–7.7	–1.8	–5.8	23.1	–1.5
May	–2.1	–3.0	–8.1	5.0	3.4	–5.0	–2.7	2.1	–4.1
June	–2.4	–3.1	–8.5	2.8	1.6	–3.8	–18.7	–2.3	0.6
July	–5.1	–6.4	–9.3	2.0	1.2	–7.7	–15.0	–7.0	–5.4
Aug.	3.5	4.1	4.1	1.5	1.9	5.7	–11.2	18.7	5.8
Sept.	0.5	1.2	3.2	–3.2	1.0	–1.2	–3.6	14.7	2.2
Oct.	3.7	5.5	1.5	–3.1	10.8	0.0	–1.3	18.8	1.7
Nov.	1.4	2.0	–2.0	0.1	3.7	0.8	1.4	30.3	–2.0
Dec.	–1.1	–0.6	–3.0	–2.6	–0.9	–1.8	–0.9	16.0	–2.0
2006 Jan.	1.4	1.4	–3.9	2.7	1.0	1.8	–8.6	2.3	4.0
Feb.	–1.8	–3.2	–1.6	4.4	6.0	–1.7	–12.4	–4.9	–6.3
March	3.3	4.7	3.7	–2.8	3.9	3.2	2.3	8.8	2.5
April	–3.4	–1.7	–12.6	–7.7	4.6	–6.6	11.4	–12.8	–10.3
May	1.9	1.0	4.8	4.6	2.3	3.8	–7.0	–1.3	2.1
June	2.7	3.9	–4.6	0.3	2.6	2.5	9.0	0.9	1.4
July	1.3	3.2	8.7	–7.8	–2.1	6.5	–0.9	7.8	–0.2
Aug.	2.3	1.7	–2.1	5.6	2.4	2.7	11.5	20.7	–0.4
Sept.	–3.2	–3.9	–3.2	–0.3	–2.1	–1.0	–4.7	–2.8	–6.4
Oct.	1.9	3.1	–11.0	1.9	1.7	–0.2	12.8	9.5	1.0
Nov.	–2.5	–3.3	2.0	–0.2	–3.1	–3.7	–2.8	1.4	–0.6
Dec.	2.6	3.4	–5.5	1.5	–0.2	2.1	8.9	4.2	4.1
2006 Jan.	4.9	6.0	9.9	0.1	2.4	4.9	14.4	0.3	6.4
Feb.	3.0	3.6	5.4	0.2	–0.9	6.6	–2.5	0.1	5.5
March	1.1	1.1	3.4	0.4	–4.2	5.4	–7.4	8.0	4.1
April	0.2	–1.7	5.8	7.4	4.9	–1.8	–17.9	–1.6	4.0
May	0.6	1.7	–15.3	1.4	1.1	–4.3	9.8	4.8	2.9
June	1.3	0.4	–5.3	7.4	4.3	–1.5	2.4	2.7	1.0
July	4.8	2.9	8.1	17.1	7.7	–3.9	5.8	–0.6	11.4
Aug.*	–0.4	–0.2	–4.7	0.2	2.1	–2.7	–6.1	–20.8	0.7

* Provisional data.

Source: NSSG.

Table I.5

Retail sales volume (retail trade turnover at constant prices)

(Percentage changes over the corresponding period of the previous year)

Period	General index	Sub-indices			
		Food-beverages-tobacco	Clothing and footwear	Furniture and fixtures	Books-stationery-other items
2003	4.3	5.3	0.9	3.8	7.5
2004	4.5	7.1	1.4	3.9	4.7
2005	3.0	5.6	1.3	0.6	–1.1
2006	8.0	9.0	0.8	17.7	3.7
2005 III	3.3	7.3	–0.6	0.4	–1.1
IV	1.8	3.1	3.6	0.9	0.7
2006 I	4.1	8.7	–5.6	2.2	9.0
II	9.0	11.6	0.8	18.4	–1.5
III	11.0	11.8	–2.3	25.4	1.4
IV	7.7	4.4	8.1	23.7	6.7
2007 I	4.3	–0.8	9.5	18.6	12.4
II	2.0	1.9	–1.3	6.7	1.6
2004 July	6.4	13.6	2.5	2.2	3.6
Aug.	3.3	3.4	4.9	4.7	7.9
Sept.	4.3	7.6	2.5	3.4	5.2
Oct.	6.3	9.9	7.9	3.4	4.7
Nov.	2.7	6.1	0.4	–0.4	4.6
Dec.	2.0	4.2	1.8	–0.1	0.1
2005 Jan.	–2.8	6.7	–17.6	–14.8	–8.2
Feb.	4.7	7.4	14.8	–3.0	–4.3
March	6.7	10.7	3.8	4.2	–2.0
April	3.6	2.9	0.5	5.0	–4.6
May	4.9	5.1	3.5	9.1	5.5
June	4.0	4.7	0.4	4.6	0.2
July	4.1	9.3	–2.8	0.5	–1.3
Aug.	3.8	9.3	–0.2	–1.9	–2.6
Sept.	2.1	3.6	1.4	2.4	0.3
Oct.	2.4	2.9	6.1	1.3	–1.5
Nov.	1.6	3.5	0.9	1.6	–2.0
Dec.	1.5	2.8	3.7	–0.1	4.4
2006 Jan.	0.3	4.0	0.4	–8.1	4.0
Feb.	5.9	14.3	–9.6	0.0	8.6
March	6.0	8.0	–5.8	14.0	14.3
April	9.9	13.3	11.2	11.8	7.2
May	7.0	10.3	–5.9	14.4	–7.7
June	10.1	11.0	–4.6	29.0	–4.0
July	10.7	10.3	–4.8	27.6	–0.3
Aug.	10.5	12.0	–4.1	21.9	0.6
Sept.	11.9	13.1	2.1	26.4	3.5
Oct.	5.1	3.9	5.1	14.6	–5.8
Nov.	6.9	1.2	7.8	27.9	1.5
Dec.	10.6	7.3	10.5	28.1	19.9
2006 Jan.	6.0	–0.5	15.2	28.3	8.4
Feb.	3.9	–0.4	2.1	18.9	17.3
March	3.3	–1.5	14.0	11.3	11.4
April	–1.5	–1.3	–9.9	9.3	–5.4
May	3.2	2.2	3.9	8.0	3.3
June	4.5	5.0	5.2	3.4	8.3
July	2.1	–0.8	3.5	5.5	4.5

Source: NSSG. Revised index of retail sales volume (on the basis of a new NSSG sample for the year 2000).

Table I.6

Demand and gross domestic product at market prices

(1995 constant prices)

	Annual percentage changes				
	2002	2003	2004	2005	2006
Private consumption	3.6	4.5	4.7	3.4	3.9
Public consumption	6.5	–1.3	2.5	1.0	0.6
Gross fixed capital formation:	5.7	13.7	5.7	–1.4	12.7
Housing	8.8	7.3	–0.6	–1.4	32.3
Other construction	0.7	13.2	6.0	–6.1	15.3
Equipment	6.9	18.3	8.0	0.5	3.5
Other	21.0	3.4	7.0	14.5	10.9
Stocks and statistical discrepancy (% of GDP)	0.4	0.2	0.2	0.7	0.9
Domestic final demand	5.0	5.5	4.7	2.3	5.7
Exports of goods and services	–7.7	1.0	11.5	3.0	5.1
Exports of goods	–7.1	4.2	–2.5	8.2	11.0
Exports of services	–8.1	–1.3	21.8	–0.1	1.4
Final demand	2.7	4.8	5.8	2.4	5.6
Imports of goods and services	–0.8	4.8	9.3	–1.2	9.8
Imports of goods	3.7	7.7	9.0	–0.1	9.8
Imports of services	–18.7	–10.0	11.0	–7.6	9.8
GDP at market prices	3.8	4.8	4.7	3.7	4.3

Source: Ministry of Economy and Finance, April 2007.

Table II.1
Balance of payments
(Million euro)

	January – July			July		
	2004	2005	2006*	2004	2005	2006*
I CURRENT ACCOUNT BALANCE (I.A+I.B+I.C+I.D)	**–8,380.5**	**–14,824.5**	**–19,020.9**	**–435.9**	**–481.3**	**–2,349.0**
I.A TRADE BALANCE *(I.A.1– I.A.2)*	***–15,446.7***	***–20,210.6***	***–23,279.3***	***–2,330.1***	***–2,482.8***	***–4,247.9***
Oil	–3,250.6	–4,882.8	–4,971.2	–529.7	–547.5	–959.2
Non-oil	–12,196.1	–15,327.8	–18,308.1	–1,800.4	–1,935.3	–3,288.7
Ships	–247.9	–1,838.1	–2,900.3	14.2	–114.7	–636.5
Trade balance excluding oil and ships	–11,948.2	–13,489.7	–15,407.8	–1,814.6	–1,820.6	–2,652.2
I.A.1 *Exports of goods*	*7,832.2*	*9,434.6*	*9,766.9*	*1,252.4*	*1,398.6*	*1,527.2*
Oil	1,078.1	1,880.0	1,604.9	248.4	276.9	282.9
Ships (receipts)	1,193.5	987.0	1,206.4	138.2	144.1	225.8
Other	5,560.6	6,567.6	6,955.6	865.8	977.6	1,018.5
I.A.2 *Imports of goods*	*23,278.9*	*29,645.2*	*33,046.2*	*3,582.5*	*3,881.4*	*5,775.2*
Oil	4,328.7	6,762.8	6,576.1	778.1	824.4	1,242.1
Ships (payments)	1,441.4	2,825.1	4,106.7	124.0	258.8	862.3
Other	17,508.8	20,057.3	22,363.4	2,680.4	2,798.2	3,670.8
I.B SERVICES BALANCE *(I.B.1–I.B.2)*	***8,354.6***	***7,851.8***	***8,442.1***	***2,366.0***	***2,612.8***	***2,648.9***
I.B.1 *Receipts*	*15,063.1*	*15,249.4*	*16,614.9*	*3,425.4*	*3,698.8*	*4,067.9*
Travel	5,290.5	5,566.4	5,705.9	1,997.0	2,241.4	2,275.3
Transport	8,247.9	8,193.2	9,199.8	1,173.0	1,200.1	1,508.8
Other	1,524.6	1,489.8	1,709.2	255.4	257.2	283.7
I.B.2 *Payments*	*6,708.5*	*7,397.6*	*8,172.8*	*1,059.3*	*1,086.0*	*1,419.0*
Travel	1,407.7	1,335.1	1,402.1	250.0	215.9	222.0
Transport	3,485.4	3,987.9	4,303.7	510.8	549.1	727.9
Other	1,815.4	2,074.5	2,467.0	298.5	321.0	469.2
I.C INCOME BALANCE *(I.C.1– I.C.2)*	***–3,327.4***	***–4,294.2***	***–5,584.2***	***–793.4***	***–756.7***	***–1,140.5***
I.C.1 *Receipts*	*1,854.6*	*1,942.4*	*2,663.9*	*255.7*	*335.0*	*363.8*
Wages, salaries	160.6	181.3	210.5	25.2	25.7	35.9
Interest, dividends, profits	1,694.0	1,761.1	2,453.5	230.5	309.3	327.9
I.C.2 *Payments*	*5,182.0*	*6,236.7*	*8,248.1*	*1,049.1*	*1,091.7*	*1,504.4*
Wages, salaries	121.3	160.6	186.4	20.9	21.5	26.4
Interest, dividends, profits	5,060.7	6,076.0	8,061.7	1,028.2	1,070.2	1,477.9
I.D. CURRENT TRANSFERS BALANCE *(1.D.1–1.D.2)*	***2,039.1***	***1,828.4***	***1,400.5***	***321.5***	***145.3***	***390.7***
I.D.1 *Receipts*	*4,422.5*	*3,868.8*	*3,775.8*	*546.7*	*388.8*	*676.7*
General government (mainly EU transfers)	3,174.4	2,482.0	2,533.7	311.3	171.1	490.2
Other (emigrants' remittances, etc.)	1,248.2	1,386.8	1,242.1	235.5	217.7	186.5
I.D.2 *Payments*	*2,383.4*	*2,040.4*	*2,375.3*	*225.2*	*243.5*	*286.0*
General government (mainly to the EU)	1,920.4	1,569.9	1,792.0	145.4	171.2	185.1
Other	463.0	470.5	583.3	79.8	72.3	100.9
II CAPITAL TRANSFERS BALANCE (II.1–II.2)	**1,025.4**	**2,002.9**	**2,490.4**	**–21.9**	**494.6**	**153.1**
II.1 *Receipts*	*1,190.2*	*2,159.3*	*2,679.0*	*38.1*	*520.2*	*192.6*
General government (EU transfers)	1,084.7	2,050.2	2,540.3	21.6	503.1	167.3
Other	105.5	109.1	138.8	16.5	17.1	25.3
II.2 *Payments*	*164.7*	*156.4*	*188.7*	*60.0*	*25.7*	*39.4*
General government (mainly to the EU)	11.6	18.2	16.8	1.8	6.4	2.3
Other	153.2	138.2	171.9	58.2	19.3	37.1
III CURRENT ACCOUNT AND CAPITAL TRANSFERS BALANCE (I+II)	**–7,355.0**	**–12,821.6**	**–16,530.6**	**–457.8**	**13.2**	**–2,195.8**
IV FINANCIAL ACCOUNT BALANCE (IV.A+IV.B+IV.C+IV.D)	**7,371.4**	**12,747.9**	**16,453.3**	**265.3**	**–499.0**	**1,842.0**
IV.A DIRECT INVESTMENT[1]	***15.0***	***969.5***	***–2,002.5***	***–129.7***	***–40.4***	***189.5***
By residents abroad	–791.3	–494.5	–2,894.9	–228.9	–152.9	–155.2
By non-residents in Greece	806.3	1,463.9	892.4	99.2	112.6	344.7
IV.B PORTFOLIO INVESTMENT[1]	***8,149.4***	***2,541.7***	***15,432.9***	***3,210.4***	***427.8***	***2,222.1***
Assets	–10,854.1	–6,197.2	–9,567.8	176.6	–1,024.6	–1,188.6
Liabilities	19,003.5	8,738.9	25,000.7	3,033.8	1,452.4	3,410.7
IV.C OTHER INVESTMENT[1]	***–891.0***	***9,475.7***	***3,072.9***	***–2,735.4***	***–910.4***	***–446.6***
Assets	–13,583.5	–4,070.8	–9,917.9	–2,515.4	–4,370.0	–1,148.2
Liabilities	12,692.6	13,546.5	12,990.8	–220.0	3,459.6	701.6
(General government loans)	688.3	–148.2	–1,884.4	306.7	218.4	–117.1
IV.D CHANGE IN RESERVE ASSETS[2]	***98.0***	***–239.0***	***–50.0***	***–80.0***	***24.0***	***–123.0***
V ERRORS AND OMISSIONS	**–16.4**	**73.8**	**77.3**	**192.5**	**485.7**	**353.9**
RESERVE ASSETS[3]				***1,896.0***	***2,184.0***	***2,219.0***

1 (+) net inflow, (–) net outflow.
2 (+) decrease, (–) increase.
3 Reserve assets, as defined by the European Central Bank, comprise monetary gold, the reserve position in the IMF, special drawing rights and Bank of Greece claims in foreign currency on non-euro area residents. Excluded are euro-denominated claims on non-euro area residents, claims in foreign currency and in euro on euro area residents and the Bank of Greece share in the capital and reserves of the ECB.
* Provisional data.
Source: Bank of Greece.

Table II.2

Revised nominal exchange rate of the euro, weighted on the basis of Greece's external trade*

(Period averages)

Period	Index (1999 Q1=100)	Percentage changes over:[1]	
		Previous period	Previous year
2002	94.7	1.9	1.9
2003	98.9	4.5	4.5
2004	100.3	1.4	1.4
2005	99.6	–0.7	–0.7
2006	99.7	0.1	0.1
2005 I	100.5	–0.4	0.1
II	99.7	–0.9	0.0
III	99.2	–0.5	–0.8
IV	99.0	–0.2	–1.9
2006 I	98.9	–0.1	–1.6
II	99.8	0.9	0.1
III	100.1	0.3	0.9
IV	100.1	0.0	1.1
2007 I	100.4	0.3	1.5
II	100.9	0.6	1.2
III	101.1	0.1	1.0
2005 Jan.	100.7	–0.5	–0.1
Feb.	100.3	–0.4	–0.3
March	100.6	0.3	0.6
April	100.3	–0.3	0.9
May	99.8	–0.4	0.0
June	98.9	–0.9	–0.9
July	99.1	0.2	–0.9
Aug.	99.3	0.2	–0.7
Sept.	99.2	–0.1	–1.0
Oct.	99.1	0.0	–1.4
Nov.	98.9	–0.2	–2.0
Dec.	98.9	0.0	–2.3
2006 Jan.	99.0	0.1	–1.7
Feb.	98.7	–0.3	–1.6
March	98.9	0.3	–1.6
April	99.3	0.4	–1.0
May	99.8	0.5	0.0
June	100.1	0.2	1.2
July	100.1	0.0	1.0
Aug.	100.1	0.0	0.8
Sept.	100.0	–0.1	0.9
Oct.	99.8	–0.2	0.7
Nov.	100.0	0.2	1.2
Dec.	100.4	0.4	1.5
2007 Jan.	100.2	–0.2	1.2
Feb.	100.3	0.2	1.7
March	100.6	0.3	1.7
April	101.0	0.3	1.7
May	101.0	0.0	1.2
June	100.9	–0.1	0.8
July	101.0	0.2	0.9
Aug.	100.9	–0.1	0.8
Sept.	101.3	0.4	1.3

* The nominal effective exchange rate (NEER) is the value of a representative basket of foreign currencies, each of which is weighted on the basis of its importance in the country's external trade. Up to end-2000, the NEER of the drachma was calculated by weighting the individual bilateral exchange rates of the drachma against the other currencies, as these rates evolved in the foreign exchange market. Since 1 January 2001, when Greece adopted the euro, the revised NEER index comprises Greece's 28 major trading partners (including the other 12 euro area countries, including Slovenia) and the weights are calculated on the basis of imports and exports of manufacturing goods (categories 5-8 of the Standardised International Trade Classification – SITC 5-8) during the period 1999-2001, also taking account of competition in third countries. This index should not be confused with the effective exchange rate of the euro, which is calculated on the basis of the external trade of the euro area as a whole.

1 Positive values indicate an appreciation of the euro, negative ones a depreciation.

Source: Bank of Greece.

Table II.3

Bilateral exchange rates of the euro*

(Units of national currency per euro, period averages)

Period	US dollar	Percentage change over:		Japanese yen	Percentage change over:		Danish krone	Percentage change over:		Pound sterling	Percentage change over:	
		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year
2002	0.9456	5.6	5.6	118.06	8.6	8.6	7.4305	–0.3	–0.3	0.62883	1.1	1.1
2003	1.1312	19.6	19.6	130.97	10.9	10.9	7.4307	0.002	0.002	0.69199	10.0	10.0
2004	1.2439	10.0	10.0	134.44	2.7	2.7	7.4399	0.1	0.1	0.67866	–1.9	–1.9
2005	1.2441	0.02	0.02	136.85	1.8	1.8	7.4518	0.2	0.2	0.68380	0.8	0.8
2006	1.2556	0.9	0.9	146.02	6.7	6.7	7.4591	0.1	0.1	0.68173	–0.3	–0.3
2004 I	1.2497	5.1	16.5	133.97	3.5	5.0	7.4495	0.2	0.3	0.67987	–2.5	1.5
II	1.2046	–3.6	5.9	132.20	–1.3	–1.9	7.4393	–0.1	0.2	0.66704	–1.9	–4.9
III	1.2220	1.4	8.6	134.38	1.6	1.7	7.4367	–0.03	0.1	0.67216	0.8	–3.8
IV	1.2977	6.2	9.1	137.11	2.0	5.9	7.4343	–0.03	–0.03	0.69507	3.4	–0.4
2005 I	1.3113	1.0	4.9	137.01	–0.1	2.3	7.4433	0.1	–0.1	0.69362	–0.2	2.0
II	1.2594	–4.0	4.5	135.42	–1.2	2.4	7.4463	0.04	0.1	0.67856	–2.2	1.7
III	1.2199	–3.1	–0.2	135.62	0.1	0.9	7.4588	0.2	0.3	0.68344	0.7	1.7
IV	1.1884	–2.6	–8.4	139.41	2.8	1.7	7.4586	–0.004	0.3	0.67996	–0.5	–2.2
2006 I	1.2023	1.2	–8.3	140.51	0.8	2.6	7.4621	0.05	0.3	0.68625	0.9	–1.1
II	1.2582	4.7	–0.1	143.81	2.3	6.2	7.4581	–0.1	0.2	0.68778	0.2	1.4
III	1.2743	1.3	4.5	148.09	3.0	9.2	7.4604	0.03	0.02	0.67977	–1.2	–0.5
IV	1.2887	1.1	8.4	151.72	2.5	8.8	7.4557	–0.1	–0.04	0.67314	–1.0	–1.0
2007 I	1.3106	1.7	9.0	156.43	3.1	11.3	7.4524	–0.04	–0.1	0.67062	–0.4	–2.3
II	1.3481	2.9	7.1	162.89	4.1	13.3	7.4500	–0.03	–0.1	0.67880	1.2	–1.3
III	1.3738	1.9	7.8	161.90	–0.6	9.3	7.4446	–0.1	–0.2	0.68001	0.2	0.03
2005 Jan. . . .	1.3119	–2.2	4.0	135.63	–2.5	1.1	7.4405	0.1	–0.1	0.69867	0.5	0.9
Feb. . . .	1.3014	–0.8	2.9	136.55	0.7	1.3	7.4427	0.03	–0.1	0.68968	–1.3	1.9
March .	1.3201	1.4	7.7	138.83	1.7	4.3	7.4466	0.1	–0.04	0.69233	0.4	3.1
April . .	1.2938	–2.0	7.9	138.84	0.002	7.6	7.4499	0.04	0.1	0.68293	–1.4	2.6
May . . .	1.2694	–1.9	5.7	135.37	–2.5	0.7	7.4443	–0.1	0.1	0.68399	0.2	1.8
June . .	1.2165	–4.2	0.2	132.22	–2.3	–0.5	7.4448	0.01	0.1	0.66895	–2.2	0.7
July . . .	1.2037	–1.0	–1.9	134.75	1.9	0.5	7.4584	0.2	0.3	0.68756	2.8	3.3
Aug. . .	1.2292	2.1	1.0	135.98	0.9	1.1	7.4596	0.02	0.3	0.68527	–0.3	2.4
Sept. . .	1.2256	–0.3	0.3	136.06	0.1	1.2	7.4584	–0.02	0.3	0.67760	–1.1	–0.5
Oct. . .	1.2015	–2.0	–3.8	138.05	1.5	1.5	7.4620	0.05	0.3	0.68137	0.6	–1.5
Nov. . .	1.1786	–1.9	–9.3	139.59	1.1	2.6	7.4596	–0.03	0.4	0.67933	–0.3	–2.8
Dec. . .	1.1856	0.6	–11.6	140.58	0.7	1.0	7.4541	–0.1	0.3	0.67922	–0.02	–2.3
2006 Jan. . . .	1.2103	2.1	–7.7	139.82	–0.5	3.1	7.4613	0.1	0.3	0.68598	1.0	–1.8
Feb. . . .	1.1938	–1.4	–8.3	140.77	0.7	3.1	7.4641	0.04	0.3	0.68297	–0.4	–1.0
March .	1.2020	0.7	–8.9	140.96	0.1	1.5	7.4612	–0.04	0.2	0.68935	0.9	–0.4
April . .	1.2271	2.1	–5.2	143.59	1.9	3.4	7.4618	0.01	0.2	0.69463	0.8	1.7
May . . .	1.2770	4.1	0.6	142.70	–0.6	5.4	7.4565	–0.07	0.2	0.68330	–1.6	–0.1
June . .	1.2650	–0.9	4.0	145.11	1.7	9.8	7.4566	0.001	0.2	0.68666	0.5	2.6
July . . .	1.2684	0.3	5.4	146.70	1.1	8.9	7.4602	0.05	0.02	0.68782	0.2	0.04
Aug. . .	1.2811	1.0	4.2	148.53	1.3	9.2	7.4609	0.01	0.02	0.67669	–1.6	–1.3
Sept. . .	1.2727	–0.7	3.8	148.99	0.3	9.5	7.4601	–0.01	0.02	0.67511	–0.2	–0.4
Oct. . .	1.2611	–0.9	5.0	149.65	0.4	8.4	7.4555	–0.06	–0.1	0.67254	–0.4	–1.3
Nov. . .	1.2881	2.1	9.3	151.11	1.0	8.2	7.4564	0.012	–0.04	0.67397	0.2	–0.8
Dec. . .	1.3213	2.6	11.4	154.82	2.5	10.1	7.4549	–0.02	0.01	0.67286	–0.2	–0.9
2007 Jan. . . .	1.2999	–1.6	7.4	156.56	1.1	12.0	7.4539	–0.01	–0.1	0.66341	–1.4	–3.3
Feb. . . .	1.3074	0.6	9.5	157.60	0.7	12.0	7.4541	0.003	–0.1	0.66800	0.7	–2.2
March .	1.3242	1.3	10.2	155.24	–1.5	10.1	7.4494	–0.1	–0.2	0.68021	1.8	–1.3
April . .	1.3516	2.1	10.1	160.68	3.5	11.9	7.4530	0.05	–0.1	0.67934	–0.1	–2.2
May . . .	1.3511	–0.04	5.8	163.22	1.6	14.4	7.4519	–0.01	–0.1	0.68136	0.3	–0.3
June . .	1.3419	–0.7	6.1	164.55	0.8	13.4	7.4452	–0.1	–0.2	0.67562	–0.8	–1.6
July . . .	1.3716	2.2	8.1	166.76	1.3	13.7	7.4410	–0.1	–0.3	0.67440	–0.2	–2.0
Aug. . .	1.3622	–0.7	6.3	159.05	–4.6	7.1	7.4429	0.03	–0.2	0.67766	0.5	0.1
Sept. . .	1.3896	2.0	9.2	159.82	0.5	7.3	7.4506	0.1	–0.1	0.68887	1.7	2.0

* Positive values indicate an appreciation of the euro, negative ones a depreciation.

Sources: Bank of Greece and European Central Bank (ECB).

Table II.3 *(continued)*

Bilateral exchange rates of the euro*

(Units of national currency per euro, period averages)

Period	Swedish krona			Swiss franc			Norwegian krone			Australian dollar			Canadian dollar		
		Percentage change over:			Percentage change over:			Percentage change over:			Percentage change over:			Percentage change over:	
		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year		Previous period	Previous year
2002	9.16	–1.0	–1.0	1.467	–2.9	–2.9	7.51	–6.7	–6.7	1.738	0.3	0.3	1.484	7.0	7.0
2003	9.12	–0.4	–0.4	1.521	3.7	3.7	8.00	6.6	6.6	1.738	0.02	0.02	1.582	6.6	6.6
2004	9.12	0.001	0.001	1.544	1.5	1.5	8.37	4.6	4.6	1.690	–2.7	–2.7	1.617	2.2	2.2
2005	9.28	1.7	1.7	1.548	0.3	0.3	8.01	–4.3	–4.3	1.632	–3.5	–3.5	1.509	–6.7	–6.7
2006	9.25	–0.3	–0.3	1.573	1.6	1.6	8.05	0.5	0.5	1.667	2.1	2.1	1.424	–5.6	–5.6
2004 I	9.18	1.9	0.02	1.569	1.0	7.0	8.63	5.0	14.0	1.634	–1.7	–9.7	1.648	5.3	1.7
II	9.14	–0.4	0.03	1.537	–2.0	1.3	8.26	–4.3	3.9	1.691	3.5	–4.7	1.637	–0.7	3.1
III	9.16	0.1	–0.1	1.536	–0.1	–0.6	8.39	1.5	1.7	1.723	1.9	0.8	1.600	–2.3	3.0
IV	9.01	–1.6	0.04	1.533	–0.2	–1.3	8.20	–2.3	–0.3	1.713	–0.5	3.1	1.584	–1.0	1.1
2005 I	9.07	0.7	–1.2	1.549	1.0	–1.3	8.24	0.5	–4.5	1.688	–1.5	3.3	1.608	1.6	–2.4
II	9.21	1.5	0.7	1.544	–0.3	0.4	8.05	–2.3	–2.6	1.639	–2.9	–3.1	1.568	–2.5	–4.3
III	9.37	1.7	2.3	1.553	0.6	1.1	7.88	–2.1	–6.0	1.605	–2.0	–6.8	1.467	–6.4	–8.3
IV	9.47	1.1	5.1	1.547	–0.4	0.9	7.88	–0.04	–3.9	1.598	–0.4	–6.7	1.396	–4.9	–11.9
2006 I	9.35	–1.3	3.1	1.559	0.8	0.7	8.02	1.8	–2.6	1.627	1.8	–3.6	1.389	–0.4	–13.6
II	9.30	–0.6	1.0	1.563	0.3	1.3	7.83	–2.4	–2.7	1.684	3.5	2.7	1.411	1.5	–10.0
III	9.23	–0.7	–1.4	1.577	0.9	1.5	8.06	2.9	2.3	1.683	–0.04	4.8	1.428	1.2	–2.6
IV	9.14	–1.0	–3.6	1.593	1.0	2.9	8.27	2.6	5.0	1.674	–0.5	4.7	1.467	2.7	5.1
2007 I	9.19	0.6	–1.7	1.616	1.5	3.7	8.17	–1.2	1.8	1.667	–0.4	2.4	1.536	4.7	10.5
II	9.26	0.7	–0.4	1.648	2.0	5.4	8.11	–0.8	3.5	1.621	–2.7	–3.7	1.479	–3.7	4.8
III	9.26	0.1	0.4	1.647	–0.03	4.5	7.92	–2.3	–1.8	1.623	0.1	–3.6	1.437	–2.8	0.6
2005 Jan. ...	9.05	0.7	–1.0	1.547	0.7	–1.2	8.21	–0.1	–4.4	1.715	–1.8	4.7	1.606	–1.7	–1.8
Feb. ...	9.09	0.4	–1.0	1.550	0.2	–1.5	8.32	1.3	–5.2	1.667	–2.8	2.5	1.613	0.4	–4.1
March .	9.09	0.04	–1.6	1.549	–0.05	–1.1	8.19	–1.6	–4.1	1.681	0.8	2.7	1.606	–0.4	–1.5
April ..	9.17	0.9	0.02	1.547	–0.1	–0.5	8.18	–0.1	–1.5	1.674	–0.4	3.7	1.599	–0.5	–0.5
May ...	9.19	0.3	0.7	1.545	–0.2	0.3	8.08	–1.2	–1.5	1.657	–1.0	–2.7	1.594	–0.3	–3.6
June ..	9.26	0.8	1.3	1.539	–0.4	1.3	7.89	–2.3	–4.7	1.587	–4.2	–9.2	1.511	–5.2	–8.4
July ...	9.43	1.8	2.5	1.558	1.2	2.0	7.92	0.3	–6.5	1.600	0.8	–6.6	1.473	–2.5	–9.2
Aug. ..	9.34	–0.9	1.7	1.553	–0.3	0.9	7.92	–0.05	–5.0	1.614	0.9	–5.8	1.482	0.6	–7.4
Sept. ..	9.33	–0.1	2.7	1.550	–0.2	0.4	7.81	–1.4	–6.6	1.601	–0.8	–8.0	1.445	–2.5	–8.3
Oct. ..	9.42	0.9	4.0	1.549	–0.04	0.4	7.83	0.3	–4.9	1.594	–0.4	–6.5	1.415	–2.1	–9.3
Nov. ..	9.56	1.5	6.3	1.545	–0.3	1.5	7.83	–0.1	–3.8	1.603	0.6	–5.0	1.394	–1.4	–10.3
Dec. ..	9.43	–1.4	5.0	1.548	0.2	0.7	7.97	1.8	–3.0	1.598	–0.3	–8.5	1.378	–1.2	–15.6
2006 Jan. ...	9.31	–1.3	2.9	1.549	0.1	0.2	8.04	0.8	–2.1	1.615	1.1	–5.8	1.402	1.8	–12.7
Feb. ...	9.34	0.3	2.8	1.558	0.6	0.5	8.06	0.3	–3.1	1.610	–0.3	–3.4	1.372	–2.2	–14.9
March .	9.40	0.6	3.4	1.569	0.7	1.3	7.98	–1.0	–2.6	1.654	2.7	–1.6	1.392	1.4	–13.4
April ..	9.33	–0.7	1.8	1.575	0.4	1.8	7.84	–1.7	–4.1	1.666	0.7	–0.5	1.405	1.0	–12.1
May ...	9.33	–0.04	1.5	1.556	–1.2	0.7	7.80	–0.5	–3.5	1.671	0.3	0.9	1.417	0.9	–11.1
June ..	9.23	–1.0	–0.3	1.560	0.2	1.4	7.86	0.7	–0.5	1.710	2.3	7.7	1.409	–0.6	–6.8
July ...	9.22	–0.2	–2.2	1.569	0.5	0.7	7.94	1.1	0.2	1.687	–1.4	5.4	1.430	1.5	–2.9
Aug. ..	9.21	–0.1	–1.4	1.578	0.6	1.6	7.99	0.7	1.0	1.679	–0.5	4.0	1.434	0.2	–3.2
Sept. ..	9.27	0.6	–0.7	1.584	0.4	2.2	8.26	3.3	5.7	1.684	0.3	5.2	1.420	–0.9	–1.7
Oct. ..	9.25	–0.1	–1.8	1.590	0.4	2.6	8.40	1.7	7.2	1.673	–0.6	5.0	1.424	0.2	0.6
Nov. ..	9.10	–1.6	–4.8	1.592	0.2	3.1	8.24	–1.8	5.3	1.668	–0.3	4.1	1.463	2.8	5.0
Dec. ..	9.04	–0.7	–4.2	1.597	0.3	3.2	8.16	–1.1	2.3	1.681	0.8	5.2	1.521	3.9	10.4
2007 Jan. ...	9.08	0.5	–2.5	1.615	1.2	4.3	8.28	1.5	3.0	1.660	–1.3	2.8	1.528	0.5	9.0
Feb. ...	9.19	1.2	–1.6	1.621	0.4	4.1	8.09	–2.3	0.4	1.671	0.6	3.8	1.531	0.2	11.6
March .	9.30	1.2	–1.1	1.612	–0.5	2.8	8.13	0.6	2.0	1.670	–0.02	1.0	1.547	1.1	11.2
April ..	9.24	–0.7	–1.0	1.637	1.6	4.0	8.12	–0.2	3.5	1.634	–2.2	–2.0	1.533	–0.9	9.1
May ...	9.21	–0.3	–1.3	1.651	0.8	6.1	8.14	0.2	4.4	1.638	0.3	–2.0	1.480	–3.5	4.4
June ..	9.33	1.3	1.0	1.654	0.2	6.0	8.06	–1.0	2.6	1.593	–2.7	–6.9	1.429	–3.4	1.4
July ...	9.18	–1.6	–0.4	1.657	0.1	5.6	7.94	–1.5	–0.01	1.581	–0.8	–6.3	1.442	0.9	0.8
Aug. ..	9.32	1.5	1.2	1.638	–1.1	3.9	7.97	0.4	–0.2	1.644	4.0	–2.1	1.442	0.02	0.6
Sept. ..	9.28	–0.4	0.2	1.647	0.6	4.0	7.83	–1.8	–5.2	1.644	0.01	–2.3	1.427	–1.0	0.5

* Positive values indicate an appreciation of the euro, negative ones a depreciation.

Sources: Bank of Greece and European Central Bank (ECB).

Table III.1

Monetary aggregates of the euro area[1]

(Outstanding balances in billion euro, not seasonally adjusted)

End of period	Currency in circulation (1)	Overnight deposits (2)	**M1** (3)=(1)+(2)	Deposits with an agreed maturity of up to 2 years (4)	Deposits redeemable at notice of up to 3 months (5)	**M2** (6)=(3)+(4)+ +(5)	Repurchase agreements (repos) (7)	Money market fund units (8)	Money market paper and debt securities with an initial maturity of up to 2 years (9)	**M3**[2] (10)=(6)+(7)+ +(8)+(9)
2002	341.2	2,158.3	2,499.4	1,075.7	1,406.3	4,981.4	226.9	470.5	127.6	5,806.4
2003	397.9	2,329.2	2,727.1	1,039.2	1,529.6	5,295.8	208.7	581.5	92.7	6,178.7
2004	468.4	2,480.5	2,948.9	1,040.5	1,642.9	5,632.2	229.7	604.9	102.3	6,568.2
2005	532.8	2,946.8	3,479.6	1,123.7	1,549.6	6,152.9	221.9	615.8	126.2	7,116.8
2006	592.2	3,164.3	3,756.5	1,414.8	1,557.1	6,728.4	248.0	614.1	198.7	7,789.3
2005 Jan.	459.9	2,506.1	2,966.0	1,015.4	1,655.9	5,637.3	228.7	616.4	99.2	6,581.6
Feb.	463.6	2,506.6	2,970.7	1,013.0	1,660.3	5,643.4	227.0	615.4	114.1	6,599.9
March . .	471.8	2,525.8	2,997.6	1,017.7	1,665.2	5,680.4	227.0	614.5	106.0	6,627.8
April	481.1	2,550.0	3,031.1	1,034.8	1,672.5	5,738.4	226.3	627.8	121.0	6,713.4
May	485.8	2,578.3	3,064.1	1,035.7	1,678.7	5,778.4	239.2	634.8	113.5	6,766.0
June	496.6	2,807.8	3,304.4	1,027.4	1,520.2	5,851.9	238.8	621.1	118.8	6,830.7
July	506.4	2,815.3	3,321.8	1,042.5	1,525.7	5,890.0	238.6	635.1	119.2	6,882.9
Aug.	500.9	2,767.7	3,268.6	1,054.3	1,530.0	5,852.9	249.2	639.7	121.0	6,862.8
Sept.	507.1	2,815.4	3,322.5	1,078.4	1,532.0	5,933.0	234.4	631.5	119.9	6,918.7
Oct.	510.5	2,838.8	3,349.3	1,088.7	1,532.2	5,970.3	241.4	629.0	121.4	6,962.0
Nov.	514.5	2,864.0	3,378.5	1,085.9	1,531.3	5,995.7	239.3	629.6	130.0	6,994.7
Dec.	532.8	2,946.8	3,479.6	1,123.6	1,549.6	6,152.9	221.9	615.8	126.2	7,116.8
2006 Jan.	520.8	2,922.2	3,443.1	1,113.7	1,565.7	6,122.5	237.0	608.4	143.4	7,111.3
Feb.	524.8	2,917.2	3,442.0	1,134.8	1,569.2	6,146.1	235.0	610.2	152.7	7,143.9
March . .	532.3	2,936.0	3,468.2	1,162.0	1,570.9	6,201.2	235.9	603.1	163.1	7,203.3
April	540.3	2,992.0	3,532.3	1,201.5	1,569.3	6,303.1	249.7	613.1	163.9	7,329.7
May	543.6	3,006.5	3,550.1	1,189.1	1,568.5	6,307.7	258.2	621.6	173.7	7,361.2
June	553.7	3,044.4	3,598.1	1,208.7	1,565.7	6,372.5	245.1	616.5	161.8	7,395.9
July	562.7	3,009.8	3,572.5	1,232.9	1,562.6	6,368.0	250.5	627.4	160.3	7,406.2
Aug.	559.0	2,956.9	3,515.9	1,267.8	1,562.6	6,346.3	264.9	639.7	179.1	7,430.0
Sept.	563.2	3,018.2	3,581.4	1,304.8	1,558.9	6,445.1	263.8	645.6	178.7	7,533.2
Oct.	567.1	2,996.5	3,563.5	1,341.7	1,551.8	6,457.1	261.2	644.7	194.3	7,557.3
Nov.	571.5	3,038.2	3,609.7	1,367.3	1,543.5	6,520.5	260.8	636.9	199.4	7,617.6
Dec.	592.2	3,164.3	3,756.5	1,414.8	1,557.1	6,728.4	248.0	614.1	198.7	7,789.3
2007 Jan.	575.6	3,106.1	3,681.8	1,446.4	1,558.4	6,686.5	262.3	641.5	220.8	7,811.1
Feb.	578.7	3,095.3	3,674.0	1,469.6	1,547.0	6,690.6	268.8	652.5	231.9	7,843.7
March . .	588.3	3,146.9	3,735.3	1,534.1	1,544.8	6,814.2	282.0	666.3	240.1	8,002.5
April	594.7	3,157.9	3,752.7	1,572.7	1,537.2	6,862.5	281.8	682.3	242.4	8,069.0
May	597.6	3,178.7	3,776.3	1,599.7	1,533.4	6,909.4	285.2	702.5	255.0	8,152.0
June	604.9	3,239.2	3,844.1	1,634.1	1,526.6	7,004.8	282.1	699.6	241.6	8,228.2
July	612.9	3,213.5	3,826.3	1,694.8	1,516.4	7,037.5	287.7	712.6	240.0	8,277.9
Aug.* . . .	610.5	3,141.9	3,752.5	1,764.3	1,508.8	7,025.6	298.1	706.1	260.4	8,290.1

1 Monetary aggregates comprise monetary liabilities of MFIs and central government (Postal Savings Bank, Ministry of Finance) vis-à-vis non-MFI euro area residents excluding central government.
2 M3 and its components exclude non-euro area residents' holdings of money market fund units, money market paper and debt securities with an initial maturity of up to 2 years.
* Provisional data.
Source: ECB.

Table III.2

Greek contribution to the main monetary aggregates of the euro area

(Outstanding balances in billion euro, not seasonally adjusted)

End of period	Overnight deposits (1)	Sight deposits and current accounts (1.1)	Savings deposits (1.2)	Deposits with an agreed maturity of up to 2 years (2)	Deposits redeemable at notice of up to 3 months[1] (3)	Repurchase agreements (repos) (4)	Money market fund units (5)	Debt securities of up to 2 years[2] (6)	Total[3] (M3 excluding currency in circulation) (7)=(1)+(2)++(3)+(4)++(5)+(6)
2002	71.7	15.2	56.5	28.9	2.3	20.0	10.7	0.2	133.8
2003	79.5	17.6	61.9	32.3	2.0	10.8	15.7	0.5	140.8
2004	91.7	20.7	71.0	33.4	1.9	9.5	15.2	0.5	152.3
2005	99.2	24.8	74.4	51.8	4.4	2.7	4.9	0.4	163.4
2006	100.1	26.0	74.1	69.3	2.9	1.6	5.8	0.5	180.2
2005 Jan.	90.4	19.8	70.6	37.8	2.0	5.6	14.9	0.5	151.2
Feb.	91.9	20.8	71.1	39.4	2.0	4.4	14.6	0.5	152.8
March . .	90.9	20.4	70.6	41.0	2.0	4.2	14.2	0.4	152.6
April	91.1	20.2	70.9	42.3	2.6	3.8	13.0	0.5	153.4
May	91.5	20.2	71.2	42.6	2.8	4.1	12.5	0.5	153.9
June	96.8	23.9	72.9	42.2	3.1	3.7	10.9	0.4	157.2
July	93.8	21.8	72.0	44.4	3.3	3.3	10.7	0.4	155.9
Aug.	93.5	21.2	72.3	45.6	3.6	3.3	10.1	0.3	156.4
Sept.	94.8	22.5	72.3	46.2	3.9	3.3	7.3	0.4	155.9
Oct.	95.5	23.2	72.3	49.2	4.1	2.6	6.2	0.4	158.0
Nov.	94.9	23.1	71.8	50.6	4.5	2.7	5.5	0.4	158.6
Dec.	99.2	24.8	74.4	51.8	4.4	2.7	4.9	0.4	163.4
2006 Jan.	95.8	22.7	73.1	53.8	4.4	2.6	4.7	0.4	161.7
Feb.	95.3	22.6	72.7	55.1	4.5	2.5	4.7	0.4	162.5
March . .	95.3	22.7	72.6	56.8	4.1	2.5	4.6	0.5	163.9
April	95.6	22.3	73.3	57.9	4.0	2.4	4.6	0.6	165.1
May	95.8	22.6	73.2	59.0	3.7	2.4	4.9	0.6	166.5
June	99.2	25.1	74.0	60.4	3.6	2.5	5.2	0.6	171.5
July	98.0	24.2	73.8	61.7	3.5	2.1	5.3	0.6	171.1
Aug.	97.0	23.4	73.6	63.3	3.4	2.0	5.4	0.6	171.7
Sept.	96.8	23.4	73.3	63.7	3.3	2.1	5.5	0.5	171.9
Oct.	95.3	23.1	72.3	65.4	3.2	1.9	5.6	0.5	171.9
Nov.	95.3	23.4	71.9	66.8	3.0	1.6	5.7	0.5	173.0
Dec.	100.1	26.0	74.1	69.3	2.9	1.6	5.8	0.5	180.2
2007 Jan.	95.5	23.9	71.7	72.9	2.9	1.5	5.9	0.4	179.1
Feb.	95.0	24.0	71.0	73.7	2.8	1.4	6.2	0.3	179.5
March . .	96.7	25.3	71.4	76.0	2.7	1.2	6.5	0.3	183.4
April	96.2	24.4	71.8	77.3	2.7	1.1	6.7	0.2	184.2
May	94.3	24.4	69.8	79.4	2.7	1.3	7.0	–0.5	184.2
June	99.8	27.6	72.2	80.8	2.7	1.4	7.5	–1.1	191.0
July	96.7	25.3	71.4	87.8	2.6	1.0	7.6	–1.8	194.0
Aug.	96.5	25.4	71.1	88.4	2.6	0.9	7.8	–1.9	194.3

1 Including savings deposits in currencies other than the euro.

2 This aggregate is calculated on a consolidated basis with the other euro area countries. Consequently, domestic MFIs' holdings of debt securities with maturity up to two years issued by euro area MFIs are deducted from debt securities with maturity up to two years issued by the former MFIs.

3 The Greek M3 (as any other euro area national M3) can no longer be accurately calculated, since part of the quantity of the euro banknotes and coins that have been put into circulation in a euro area country is held by residents of other euro area countries and/or by non-residents. Due to these technical problems, the compilation of the Greek M0, M1, M2 and M3 was interrupted in January 2003.

Source: Bank of Greece.

Table III.3

Greece: deposits of domestic firms and households with OMFIs,[1] by currency and type

(Outstanding balances in million euro, not seasonally adjusted)

End of period	Total deposits	By currency		By type		
		Deposits in euro	Deposits in other currencies	Sight deposits	Savings deposits	Time deposits[2]
2002	104,761.1	87,732.3	17,028.8	13,367.3	60,406.1	30,987.7
2003	115,750.1	98,119.3	17,630.8	15,395.8	65,141.1	35,213.2
2004	128,424.6	110,206.7	18,217.9	18,274.2	73,954.2	36,196.1
2005	156,857.7	135,797.3	21,060.4	22,180.2	79,800.8	54,876.1
2006	173,370.4	151,321.5	22,048.9	23,525.0	77,858.2	71,987.2
2005 Jan.	131,749.7	114,232.0	17,517.7	17,586.6	73,515.5	40,647.6
Feb.	134,088.9	116,771.1	17,317.8	17,866.2	74,096.0	42,126.7
March	134,801.8	116,303.2	18,498.7	17,521.9	73,527.1	43,752.9
April	136,854.8	118,087.9	18,766.9	17,333.7	74,453.1	45,068.0
May	137,472.3	118,223.8	19,248.5	17,189.9	75,046.6	45,235.8
June	142,951.8	123,548.2	19,403.6	20,868.4	77,036.6	45,046.9
July	142,705.3	122,700.2	20,005.1	19,144.9	76,318.4	47,241.9
Aug.	143,733.0	123,239.3	20,493.7	18,436.6	76,764.9	48,531.5
Sept.	146,180.7	125,211.8	20,968.9	19,789.0	77,143.1	49,248.6
Oct.	150,136.2	129,055.6	21,080.6	20,542.2	77,351.8	52,242.2
Nov.	151,140.9	129,736.1	21,404.8	20,228.8	77,297.6	53,614.4
Dec.	156,857.7	135,797.3	21,060.4	22,180.2	79,800.8	54,876.7
2006 Jan.	155,334.6	134,509.7	20,824.9	20,097.8	78,361.8	56,875.1
Feb.	156,125.0	134,733.6	21,391.4	19,797.5	78,114.4	58,213.2
March	157,740.9	136,352.9	21,388.0	20,229.3	77,611.2	59,900.5
April	158,730.2	137,689.9	21,040.3	19,707.4	78,160.7	60,862.1
May	159,942.6	138,812.0	21,130.6	20,063.9	77,829.2	62,049.5
June	164,328.2	143,200.2	21,128.0	22,398.2	78,543.2	63,386.8
July	164,473.3	143,231.3	21,242.0	21,667.6	78,137.8	64,667.9
Aug.	164,706.1	143,088.1	21,618.0	20,710.5	77,844.8	66,150.8
Sept.	164,750.2	143,309.9	21,440.3	20,693.0	77,479.1	66,578.1
Oct.	164,848.2	143,096.0	21,752.2	20,410.6	76,266.5	68,171.1
Nov.	166,195.3	144,335.6	21,859.7	21,116.2	75,520.4	69,558.6
Dec.	173,370.4	151,321.5	22,048.9	23,525.0	77,858.2	71,987.2
2007 Jan.	171,937.9	149,321.7	22,616.2	20,943.4	75,322.8	75,671.7
Feb.	172,166.2	150,424.2	21,742.0	21,109.9	74,619.3	76,437.1
March	176,068.3	154,217.8	21,850.5	22,393.5	74,931.5	78,743.4
April	177,261.9	155,599.4	21,662.5	21,878.6	75,236.8	80,146.5
May	177,486.2	154,859.0	22,627.2	21,160.9	73,954.4	82,370.9
June	184,148.2	161,027.9	23,120.2	24,695.0	75,647.6	83,805.6
July	188,181.4	164,079.4	24,102.0	22,986.3	74,519.2	90,675.9
Aug.	188,054.4	163,993.2	24,061.2	22,398.6	74,358.8	91,297.0

1 Other Monetary Financial Institutions (OMFIs) comprise credit institutions (other than the Bank of Greece) and money market funds.

2 Including blocked deposits.

Source: Bank of Greece.

Table III.4

Domestic MFI loans to domestic enterprises and households, by branch of economic activity

(Balances in million euro)

End of period	Grand total	Enterprises						Households			
		Total	Agri-culture	Industry[1]	Trade	Tourism	Other	Total	Housing	Consumer	Other
2002	86,510.5	55,012.2	3,224.7	14,364.0	15,670.8	2,903.2	18,849.5	31,498.3	21,224.7	9,755.4	518.2
2003	101,178.1	60,979.3	3,082.7	15,865.1	16,514.4	3,488.2	22,028.9	40,198.8	26,534.2	12,409.6	1,255.0
2004	117,201.7	65,566.3	3,248.0	15,675.6	18,821.6	4,040.0	23,781.1	51,635.4	33,126.8	17,053.8	1,454.8
2005	136,981.1	71,282.9	2,954.0	15,753.8	19,958.4	4,189.8	28,426.9	65,698.2	43,199.4	20,850.0	1,648.8
2006	156,896.4	76,659.8	3,051.0	16,371.4	20,572.0	4,194.1	32,471.3	80,236.6	52,502.5	25,599.2	2,134.9
2005 Jan.	118,387.3	65,985.6	3,237.8	15,645.2	18,921.1	4,079.3	24,102.2	52,401.7	33,672.4	17,275.8	1,453.5
Feb..	118,906.4	65,521.9	3,161.6	15,623.8	19,104.7	4,129.9	23,501.9	53,384.5	34,281.6	17,610.7	1,492.2
March . . .	120,704.9	66,096.9	3,079.3	15,565.9	19,309.8	4,180.8	23,961.1	54,608.0	35,091.5	17,995.6	1,520.9
April	123,037.2	67,097.9	3,059.3	15,926.1	19,565.9	4,211.2	24,335.4	55,939.3	35,878.7	18,550.0	1,510.6
May	124,228.8	67,257.5	3,038.1	15,872.9	19,520.5	4,225.7	24,600.3	56,971.3	36,610.2	18,896.4	1,464.7
June	125,452.3	68,474.1	3,096.1	15,918.8	20,142.8	4,293.7	25,022.7	56,978.2	36,102.8	19,386.6	1,488.8
July	127,215.3	69,613.6	3,119.2	16,123.2	20,352.3	4,135.7	25,883.2	57,601.7	37,238.6	18,897.0	1,466.1
Aug.	127,788.5	69,212.3	3,123.3	15,838.2	20,027.5	4,110.4	26,112.9	58,576.2	37,850.0	19,245.1	1,481.1
Sept.	129,507.9	69,305.5	2,939.4	15,674.2	19,985.6	4,073.7	26,632.6	60,202.4	39,022.1	19,628.5	1,551.8
Oct.	131,111.7	69,462.4	2,884.1	15,757.2	19,905.6	4,089.4	26,826.1	61,649.3	40,000.4	20,080.7	1,568.2
Nov.	133,136.0	69,791.5	2,919.6	15,712.5	19,717.1	4,184.2	27,258.1	63,344.5	41,244.2	20,511.7	1,588.6
Dec.	136,981.1	71,282.9	2,954.0	15,753.8	19,958.4	4,189.8	28,426.9	65,698.2	43,199.4	20,850.0	1,648.8
2006 Jan.	137,731.3	70,999.2	2,948.7	15,690.0	19,672.8	4,205.7	28,482.0	66,732.1	44,010.6	21,047.7	1,673.8
Feb..	139,714.7	71,491.8	2,957.3	15,747.6	19,389.1	4,248.8	29,149.0	68,222.9	44,873.8	21,637.5	1,711.6
March . . .	142,633.3	72,960.5	3,086.1	15,955.2	19,843.2	4,356.4	29,719.6	69,672.8	45,919.6	22,045.2	1,708.0
April	144,593.1	73,944.8	3,098.7	16,399.3	20,160.3	4,352.3	29,934.2	70,648.3	46,612.7	22,344.3	1,691.3
May	145,477.5	74,372.3	3,105.7	16,661.9	19,876.8	4,377.7	30,350.2	71,105.2	46,539.9	22,815.5	1,749.8
June	148,322.9	76,259.8	3,192.4	16,900.2	20,531.4	4,416.8	31,219.0	72,063.1	46,929.0	23,275.7	1,858.4
July	150,012.0	76,374.7	3,203.6	16,706.6	20,573.2	4,350.0	31,541.3	73,637.3	48,165.4	23,610.7	1,861.2
Aug.	150,031.2	76,033.8	3,204.1	16,658.0	20,371.5	4,301.8	31,498.4	73,997.4	48,138.4	23,956.0	1,903.0
Sept.	152,943.1	77,450.6	3,239.2	16,769.4	20,916.6	4,337.6	32,187.8	75,492.5	49,140.0	24,394.4	1,958.1
Oct.	153,584.8	76,893.8	3,226.8	16,627.6	20,662.5	4,346.0	32,030.9	76,691.0	49,923.5	24,709.6	2,057.9
Nov.	152,551.9	74,519.8	3,141.2	16,223.8	19,823.8	4,213.5	31,117.5	78,032.1	50,672.3	25,283.7	2,076.1
Dec.	156,896.4	76,659.8	3,051.0	16,371.4	20,572.0	4,194.1	32,471.3	80,236.6	52,502.5	25,599.2	2,134.9
2007 Jan.	157,445.6	75,917.1	3,021.6	16,099.9	20,119.0	4,218.6	32,458.0	81,528.5	53,517.4	25,881.3	2,129.8
Feb..	159,987.8	77,080.3	3,039.1	16,168.8	20,500.8	4,327.7	33,043.9	82,907.5	54,619.9	26,114.4	2,173.2
March . . .	164,281.1	79,285.9	3,049.5	16,366.8	21,120.2	4,355.7	34,393.7	84,995.2	56,200.1	26,572.7	2,222.4
April	165,479.2	79,008.3	3,005.9	16,364.7	21,008.8	4,361.1	34,267.8	86,470.9	57,218.4	27,071.9	2,180.6
May	168,128.9	79,941.2	3,034.2	16,706.6	21,238.3	4,380.6	34,581.5	88,187.7	58,277.3	27,714.2	2,196.2
June	173,093.9	84,391.7	3,206.8	17,077.7	22,083.4	4,439.4	37,584.4	88,702.2	58,156.5	28,101.5	2,444.2
July	173,441.0	84,073.0	3,216.2	16,876.8	22,117.2	4,388.6	37,474.2	89,368.0	58,169.6	28,596.5	2,601.9
Aug.	175,889.4	85,133.8	3,276.4	16,979.5	22,211.6	4,346.8	38,319.5	90,755.6	59,067.4	29,055.8	2,632.4

1 Comprising manufacturing and mining.

Source: Bank of Greece.

Table III.5
ECB and Bank of Greece interest rates

(Percentages per annum)

1. ECB interest rates				2. Bank of Greece interest rates				
With effect from:[1]	Deposit facility	Main refinancing operations[3]	Marginal lending facility	With effect from:	Overnight deposit facility, first tier[4]	Overnight deposit facility, second tier[4]	14-day intervention rate	Lombard rate
1999 1 Jan.	2.00	3.00	4.50	**1999** 14 Jan.	11.50	9.75	12.00	13.50
4 Jan.[2]	2.75	3.00	3.25	21 Oct.	11.00	9.75	11.50	13.00
22 Jan.	2.00	3.00	4.50	16 Dec.	10.25	9.25	10.75	12.25
9 April	1.50	2.50	3.50	27 Dec.	10.25	9.00	10.75	11.50
5 Nov.	2.00	3.00	4.00					
2000 4 Feb.	2.25	3.25	4.25	**2000** 27 Jan.	9.50	8.50	9.75	11.00
17 March	2.50	3.50	4.50	9 March	8.75	8.00	9.25	10.25
28 April	2.75	3.75	4.75	20 April	8.00	7.50	8.75	9.50
9 June	3.25	4.25	5.25	29 June	7.25	–	8.25	9.00
28 July[3]	3.25	4.25	5.25	6 Sept.	6.50	–	7.50	8.25
1 Sept.	3.50	4.50	5.50	15 Nov.	6.00	–	7.00	7.75
6 Oct.	3.75	4.75	5.75	29 Nov.	5.50	–	6.50	7.25
				13 Dec.	4.75	–	5.75	6.50
				27 Dec.	3.75	–	4.75	5.75
2001 11 May	3.50	4.50	5.50					
31 Aug.	3.25	4.25	5.25					
18 Sept.	2.75	3.75	4.75					
9 Nov.	2.25	3.25	4.25					
2002 6 Dec.	1.75	2.75	3.75					
2003 7 March	1.50	2.50	3.50					
6 June	1.00	2.00	3.00					
2005 6 Dec.	1.25	2.25	3.25					
2006 8 March	1.50	2.50	3.50					
15 June	1.75	2.75	3.75					
9 Aug.	2.00	3.00	4.00					
11 Oct.	2.25	3.25	4.25					
13 Dec.	2.50	3.50	4.50					
2007 14 March	2.75	3.75	4.75					
13 June	3.00	4.00	5.00					

1 From 1 January 1999 to 9 March 2004, the date refers to the deposit and marginal lending facilities. For main refinancing operations, changes in the rate are effective from the first operation following the date indicated. The change on 18 September 2001 was effective on that same day. From 10 March 2004 onwards, the date refers to the deposit and marginal lending facilities and to the main refinancing operations (changes effective from the first main refinancing operation following the Governing Council decision), unless otherwise indicated.

2 On 22 December 1998 the ECB announced that, as an exceptional measure between 4 and 21 January 1999, a narrow corridor of 50 basis points would be applied between the interest rate for the marginal lending facility and that for the deposit facility, aimed at facilitating the transition of market participants to the new monetary regime.

3 On 8 June 2000, the ECB announced that, starting from the operation to be settled on 28 June 2000, the main refinancing operations of the Eurosystem would be conducted as variable rate tenders. The minimum bid rate refers to the minimum interest rate at which counterparties may place their bids.

4 On 29 June 2000 the second tier of the deposit facility was abolished; the interest rate thereafter applies to the unified deposit acceptance account.

Sources: ECB and Bank of Greece.

Table III.6
Greek government paper yields

(Percentages per annum, period averages)

Period	Yield on one-year Treasury bills	Yield on government bonds						
		3-year	5-year	7-year	10-year	15-year	20-year	32-year
2002	3.50	4.06	4.45	4.78	5.12	5.24	5.52	. . .
2003	2.34	2.82	3.37	3.83	4.27	4.32	4.91	. . .
2004	2.27	2.87	3.37	3.81	4.26	4.53	4.77	. . .
2005	2.33	2.65	2.92	3.22	3.59	3.80	3.92	4.14
2006	3.44	3.58	3.72	3.87	4.07	4.16	4.23	4.42
2005 Jan.	2.31	2.72	2.96	3.29	3.69	3.99	4.12	. . .
Feb.	2.31	2.80	2.97	3.34	3.69	3.94	4.04	. . .
March	2.34	2.88	3.06	3.56	3.92	4.12	4.24	4.49
April	2.27	2.70	3.06	3.37	3.76	3.98	4.11	4.38
May	2.19	2.55	2.89	3.21	3.60	3.82	3.95	4.21
June	2.10	2.35	2.70	3.02	3.44	3.66	3.79	4.05
July	2.17	2.42	2.75	3.06	3.46	3.71	3.84	4.10
Aug.	2.22	2.49	2.79	3.07	3.47	3.69	3.82	4.08
Sept.	2.22	2.42	2.66	2.92	3.30	3.52	3.64	3.91
Oct.	2.41	2.66	2.88	3.11	3.45	3.64	3.75	4.00
Nov.	2.69	2.91	3.15	3.36	3.67	3.84	3.94	4.14
Dec.	2.78	2.95	3.14	3.31	3.57	3.73	3.82	4.02
2006 Jan.	2.84	2.99	3.17	3.32	3.60	3.71	3.79	3.98
Feb.	2.91	3.09	3.30	3.50	3.77	3.86	3.94	4.14
March	3.11	3.38	3.50	3.74	3.95	4.02	4.11	4.29
April	3.22	3.61	3.72	4.01	4.23	4.32	4.41	4.60
May	3.31	3.63	3.80	4.05	4.30	4.38	4.48	4.69
June	3.41	3.70	3.93	4.07	4.31	4.41	4.50	4.72
July	3.54	3.78	3.98	4.10	4.33	4.42	4.50	4.72
Aug.	3.61	3.72	3.88	3.98	4.19	4.29	4.37	4.58
Sept.	3.72	3.71	3.81	3.89	4.06	4.15	4.21	4.39
Oct.	3.80	3.77	3.87	3.93	4.08	4.15	4.21	4.35
Nov.	3.87	3.77	3.82	3.86	3.98	4.05	4.09	4.23
Dec.	3.92	3.84	3.89	3.93	4.04	4.12	4.17	4.30
2007 Jan.	4.06	4.01	4.08	4.13	4.28	4.33	4.38	4.51
Feb.	4.09	4.03	4.09	4.14	4.30	4.35	4.40	4.54
March	4.11	4.00	4.04	4.08	4.20	4.27	4.33	4.49
April	4.25	4.17	4.24	4.28	4.40	4.46	4.52	4.70
May[1]	4.37	4.31	4.37	4.40	4.51	4.59	–	4.77
June[1]	4.51	4.52	4.65	4.68	4.80	4.97	–	5.05
July[1]	4.56	4.54	4.64	4.67	4.79	4.96	–	5.02
Aug.[1]	4.67	4.28	4.41	4.47	4.62	4.85	–	4.91
Sept.[1]	4.72	4.20	4.34	4.39	4.56	4.82	–	4.92

1 In the market there is no bond with a residual maturity close to 20 years.

Source: Bank of Greece.

Table III.7

Greece: bank rates on new euro-denominated deposits of euro area residents

(Percentages per annum, period averages, unless otherwise indicated)

Period	Deposits by households			Deposits by non-financial corporations		
	Overnight[1,2]	Savings[2]	With an agreed maturity of up to 1 year	Overnight[2]	With an agreed maturity of up to 1 year	Repurchase agreements (repos)
2003	0.93	0.92	2.48	0.63	2.49	2.24
2004	0.91	0.90	2.29	0.55	2.17	1.98
2005	0.91	0.88	2.23	0.60	2.09	2.00
2006	1.02	0.98	2.86	0.79	2.81	2.67
2005 Jan.	0.96	0.95	2.25	0.56	2.08	1.97
Feb.	0.95	0.94	2.19	0.55	2.07	1.97
March	0.93	0.91	2.22	0.55	2.02	1.97
April	0.89	0.86	2.22	0.55	2.07	1.98
May	0.89	0.87	2.20	0.56	2.04	1.99
June	0.89	0.86	2.21	0.58	2.07	1.99
July	0.88	0.86	2.20	0.60	2.07	1.98
Aug.	0.89	0.86	2.19	0.59	2.08	1.98
Sept.	0.89	0.87	2.19	0.70	2.09	1.98
Oct.	0.89	0.87	2.22	0.65	2.10	1.97
Nov.	0.90	0.87	2.27	0.65	2.11	1.99
Dec.	0.91	0.88	2.39	0.71	2.32	2.18
2006 Jan.	0.93	0.90	2.44	0.69	2.33	2.23
Feb.	0.93	0.90	2.45	0.65	2.35	2.25
March	0.99	0.95	2.58	0.73	2.57	2.42
April	0.98	0.95	2.63	0.73	2.61	2.50
May	0.98	0.95	2.66	0.73	2.57	2.47
June	1.02	0.98	2.76	0.75	2.70	2.60
July	1.02	0.98	2.84	0.74	2.79	2.60
Aug.	1.04	1.00	2.95	0.83	2.96	2.74
Sept.	1.05	1.00	3.03	0.83	2.97	2.85
Oct.	1.11	1.06	3.24	0.93	3.15	3.02
Nov.	1.09	1.04	3.26	0.89	3.24	3.09
Dec.	1.14	1.09	3.47	0.92	3.48	3.30
2007 Jan.	1.16	1.10	3.50	0.91	3.49	3.32
Feb.	1.16	1.10	3.51	0.87	3.54	3.35
March	1.18	1.11	3.64	0.99	3.73	3.53
April	1.20	1.13	3.74	0.98	3.81	3.60
May	1.20	1.13	3.74	1.05	3.81	3.63
June	1.24	1.15	3.95	1.05	4.01	3.80
July	1.24	1.16	4.00	1.15	4.05	3.86
Aug.	1.24	1.16	4.09	1.12	4.13	3.87

1 Weighted average of the current account rate and the savings deposit rate.

2 End-of-month rate.

Source: Bank of Greece.

Table III.8

Greece: bank rates on new euro-denominated loans to euro area residents

(Percentages per annum, period averages, unless otherwise indicated)

Period	Loans to households[1]					Loans to non-financial corporations[1]		
		Consumer loans		Housing loans			With a floating rate or an initial rate fixation of up to 1 year	
	Loans without defined maturity[2,3]	With a floating rate or an initial rate fixation of up to 1 year	Average rate on total consumer loans	With a floating rate or an initial rate fixation of up to 1 year	Average rate on total housing loans	Loans without defined maturity[3,4]	Up to €1 million	Over €1 million
2003	14.41	10.57	10.47	4.51	4.78	6.86	5.29	3.98
2004	13.81	9.55	9.86	4.30	4.51	7.01	4.98	3.67
2005	13.36	8.47	9.06	4.06	4.15	6.90	5.08	3.62
2006	13.45	7.89	8.58	4.20	4.28	7.18	5.76	4.37
2005 Jan.	13.42	8.85	9.39	4.23	4.39	6.95	4.89	3.54
Feb.	13.72	8.99	9.62	4.20	4.34	6.95	5.08	3.53
March	13.51	8.53	9.43	4.15	4.27	6.94	5.00	3.70
April	13.74	8.58	9.37	4.13	4.23	6.94	5.09	3.58
May	13.63	8.88	9.13	4.12	4.21	6.89	4.96	3.47
June	13.48	8.16	8.78	4.07	4.18	6.87	4.82	3.46
July	13.14	8.45	9.35	4.06	4.14	6.82	5.01	3.50
Aug.	13.16	8.48	9.39	4.11	4.18	6.84	5.12	3.50
Sept.	13.23	8.36	8.79	3.99	4.05	6.82	5.06	3.57
Oct.	13.07	8.32	8.68	3.94	4.01	6.85	5.06	3.79
Nov.	13.09	8.28	8.56	3.88	3.93	6.93	5.41	3.84
Dec.	13.07	7.78	8.26	3.86	3.91	7.00	5.41	3.93
2006 Jan.	13.18	7.77	8.30	3.92	4.00	6.94	5.26	3.70
Feb.	13.18	8.06	8.51	3.89	3.97	6.99	5.44	3.74
March	13.22	8.09	8.44	3.92	4.02	7.13	5.50	4.15
April	13.24	7.82	8.48	3.93	4.08	7.09	5.57	3.92
May	13.22	7.84	8.66	4.00	4.15	7.10	5.61	4.17
June	13.45	8.09	8.75	4.22	4.32	7.18	5.65	4.41
July	13.41	7.85	8.59	4.28	4.36	7.19	5.70	4.40
Aug.	13.60	7.99	8.77	4.51	4.53	7.26	5.88	4.27
Sept.	13.58	8.03	8.85	4.50	4.54	7.26	5.91	4.72
Oct.	13.72	8.15	8.87	4.66	4.62	7.37	6.14	4.83
Nov.	13.81	8.19	8.86	4.69	4.52	7.25	6.15	4.94
Dec.	13.80	6.82	7.82	4.36	4.26	7.35	6.30	5.16
2007 Jan.	13.87	7.35	8.30	3.92	4.19	7.32	6.27	5.22
Feb.	13.85	7.53	8.40	3.80	4.09	7.34	6.36	5.01
March	13.88	7.60	8.23	4.00	4.09	7.45	6.38	5.08
April	13.97	7.72	8.36	4.45	4.23	7.50	6.45	5.12
May	13.92	8.18	8.74	4.46	4.25	7.47	6.51	5.06
June	14.09	7.82	8.61	4.90	4.52	7.56	6.48	5.32
July	14.12	8.00	8.70	5.01	4.53	7.56	6.44	5.12
Aug.	14.15	8.38	8.78	5.00	4.58	7.74	6.76	5.48

1 Charges are not included.
2 Weighted average of interest rates on loans to households through credit cards, open loans and current account overdrafts.
3 End-of-month rate.
4 Weighted average of interest rates on corporate loans through credit lines and sight deposit overdrafts.
Source: Bank of Greece.

Table IV.1

Net borrowing requirement of central government on a cash basis[1]

(Million euro)

	Annual data		January - August		
	2005	2006	2005	2006	2007*
Central government	**14,424**	**10,467**	**11,223**	**7,384**	**8,916**
– State budget	14,793	11,500	12,600	8,685	9,633
(Ordinary budget)[2]	10,033[4]	7,020[5]	10,488[6]	7,151[7]	7,109[8]
(Public investment budget)	4,760	4,480	2,112	1,534	2,524
– OPEKEPE[3]	–369	–1,033	–1,377	–1,301	–717
Percentage of GDP	**8.0**	**5.4**	**6.2**	**3.8**	**4.3**

1 As shown by the respective accounts with the Bank of Greece and other credit institutions.

2 Including movements in public debt management accounts.

3 Payment and Control Agency for Guidance and Guarantee Community Aid. It replaced DIDAGEP (Agricultural Markets Management Service) as from 3 September 2001.

4 Including a grant of about €2,586 million to hospitals, an expenditure of €1,239.3 million for the capital increase of the Agricultural Bank of Greece (ATE), proceeds of €1,090 million from the sale of 16.4% of OPAP (the Greek soccer pools organisation) shares and €826 million from the sale of 10% of OTE (Hellenic Telecommunications Organisation) shares, as well as an expenditure for a grant of €425 million to the Farmers' Insurance Fund (OGA).

5 Including €149.7 million from a Hellenic Telecommunications and Post Commission (EETT) revenue settlement, €299.3 million from a reduction in the Postal Savings Bank's capital, €34 million from a reduction in ATE's capital, €290 million from additional dividends of the Deposits and Loans Fund, €323 million from the sale of ATE shares, €597.4 million from the sale of Postal Savings Bank shares, €364.4 million from the sale of Emporiki Bank shares, as well as an expenditure for a grant of €422.9 million to OGA.

6 Including a grant of €1,800 million to hospitals and an expenditure of €402.1 million for the payment of liabilities to ATE, as well as an expenditure of €1,028.5 million for the capital increase of the ATE. Also including proceeds of €1,090 million from the sale of 16.4% of OPAP shares.

7 Including receipts of €323 million from the sale of ATE shares, €597.4 million from the sale of Postal Savings Bank shares and €364.4 million from the sale of Emporiki Bank shares. Also including extraordinary proceeds of €149.7 million from an EETT revenue settlement and €299.3 million from a reduction in the Postal Savings Bank's capital and an expenditure for a grant of €422.9 million to OGA.

8 Including receipts of €1,107.5 million from the sale of OTE shares and €502.8 million from the sale of Postal Savings Bank shares, as well as an expenditure of €174 million for aid to the fire-stricken.

* Provisional data.

Source: Bank of Greece.

Table IV.2

Financing of the central government borrowing requirement

(Million euro)

	Annual data				January - August					
	2005		2006		2005		2006		2007*	
	Amount	Percentage of total	Amount	Percentage of total	Amount	Percentage of total	Amount	Percentage of total	Amount	Percentage of total
Greek Treasury bills and government bonds[1]	15,325	106.2	11,342	108.4	11,942	106.4	8,840	119.7	11,653	130.7
Change in balances of central government accounts with the credit system[2]	–1,224	–8.5	–1,145	–10.9	–2,396	–21.3	–2,502	–33.9	–1,566	–17.6
External borrowing[3]	323	2.2	270	2.6	1,677	14.9	1,046	14.2	–1,171	–13.1
Total	**14,424**	**100.0**	**10,467**	**100.0**	**11,223**	**100.0**	**7,384**	**100.0**	**8,916**	**100.0**

1 Comprising domestically issued Treasury bills and government bonds, as well as bonds convertible into equity.

2 Comprising changes in central government accounts with the Bank of Greece and other credit institutions, as well as the change in the OPEKEPE account.

3 Comprising government borrowing abroad and securities issuance abroad and excluding non-residents' holdings of domestically issued government bonds. Also including changes in government deposits abroad.

* Provisional data.

Source: Bank of Greece.

Table IV.3
State budget results
(Million euro)

	Year			Percentage changes		January - July			Percentage changes	
	2005	2006	Budget for 2007	2006/ 2005	Budget for 2007/06	2005	2006	2007*	2006/ 2005	2007*/ 2006
I. REVENUE[1]	**47,446**	**52,399**	**55,260**	**10.4**	**5.5**	**26,190**	**29,544**	**31,512**	**12.8**	**6.7**
1. Ordinary budget	44,760	48,685	51,370	8.8	5.5	24,964	27,293	28,668	9.3	5.0
(of which: extraordinary revenue)	*0*	*773[4]*	*0*			*0*	*482*	*0*		
2. Public investment budget	2,686	3,714	3,890	38.3	4.7	1,226	2,251	2,844	83.6	26.3
– Own revenue	63	. . .	140			. . .	. . .	. . .		
– Revenue from the EU	2,623	. . .	3,750			. . .	. . .	. . .		
II. EXPENDITURE[1]	**58,763**	**60,770**	**64,310**	**3.4**	**5.8**	**34,321**	**35,635**	**39,436**	**3.8**	**10.7**
1.1 Ordinary budget	51,239	52,586	55,560	2.6	5.7	31,431	32,389	34,901	3.0	7.8
(Interest payments)[2]	9,774	9,589	9,750	–1.9	1.7	8,576	8,040	8,127	–6.3	1.1
1.2 Ordinary budget primary expenditure	41,465	42,997	45,810	3.7	6.5	22,855	24,349	26,774	6.5	10.0
(of which: tax refunds)	*2,554*	*2,392*	*2,200*	*–6.3*	*–8.0*	*1,506*	*1,343*	*1,729*	*–10.8*	*28.7*
2. Public investment budget	7,524	8,184	8,750	8.8	6.9	2,890	3,246	4,535	12.3	39.7
III. STATE BUDGET RESULTS	**–11,317**	**–8,371**	**–9,050**			**–8,131**	**–6,091**	**–7,925**		
Percentage of GDP	–6.2	–4.3	–4.3			–4.5	–3.1	–3.8		
1. Ordinary budget	–6,479	–3,901	–4,190			–6,467	–5,096	–6,233		
2. Public investment budget	–4,838	–4,470	–4,860			–1,664	–995	–1,691		
IV. PRIMARY DEFICIT (–)/ SURPLUS (+)	**–1,543**	**1,218**	**700**			**445**	**1,949**	**202**		
Percentage of GDP	–0.9	0.6	0.3			0.2	1.0	0.1		
AMORTISATION PAYMENTS[2]	21,752	17,856	24,247	–17.9	35.8	16,852	15,779	20,385	–6.4	29.2
MINISTRY OF NATIONAL DEFENCE PROGRAMMES FOR THE PROCUREMENT OF MILITARY EQUIPMENT[2]	1,400	2,067	1,700	47.6	–17.8	444	609	572	37.2	–6.1

1 For comparability purposes, tax refunds are included in expenditure and have not been deducted from revenue. This practice has been adopted by the Ministry of Economy and Finance in recent years.
2 From 2003 onwards, interest and amortisation payments are recorded in the off-budget item "Ministry of National Defence Programmes for the procurement of military equipment".
3 Including a grant of €330 million to OTE's personnel insurance fund (TAP-OTE) and the settlement of a €345 million liability of the Greek State to ATE. These expenditures were not included in the estimates of the Ministry of Economy and Finance for 2005, as published in the Introductory Report on the 2006 Budget.
4 Comprising €149.7 million from an EETT revenue settlement, €299.3 million (not included in the budget for 2006) from a reduction in the Greek Postal Savings Bank's capital, €34 million from a reduction in ATE'S capital and €290 million from additional dividends paid by the Deposits and Loans Fund.
* Provisional data.
Source: General Accounting Office.

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