STRUCTURAL FUNDS:

GROWTH, EMPLOYMENT AND THE

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Modelling and Forecasting the Greek Economy

by
NICOS CHRISTODOULAKIS
Athens University of Economics

and

SARANTIS KALYVITIS
Athens University of Economics

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PREFACE

The purpose of this book is to provide an analytical and modelling framework for the assessing of the effects that the Structural Funds provided by the European Union are likely to have on the economy of Greece in the short and medium run. Structural funds are channelled to Greece mainly through the Community Support Framework (CSF) of the European Union and, to a lesser extent, through the Cohesion Fund, with the main purpose of financing infrastructural projects.

The Greek CSF is designed to finance large-scale development projects and investment in physical and human capital, aiming to gear the economy onto a sustainable path of growth and prosperity. The second CSF is operational during 1994-2000 and is substantially more extensive in actions and far-reaching in impact than the first CSF that has been implemented in 1989-93. As for the other main recipient countries of European Union (EU), namely Ireland, Portugal and Spain, such an intervention has been deemed necessary in order to assist these less-developed members of the Union to modernise their economies, foster growth and approach the welfare and efficiency of the more developed members.

This process of *real* convergence is viewed as a prerequisite for the economic and social cohesion of EU, and is viewed equally critical with the *nominal* convergence objective of the Maastricht Treaty in the way of creating the Economic and Monetary Union (EMU). Per capita income in Greece was in the beginning of the 1990s less than 60% of the EU average. Unless a strong growth differential were achieved for a substantial period of time in favour of Greece, the country would have risked becoming a permanent laggard in the welfare and economic developments in the Union. In the 1960s, Greece was further behind the average European per capita income, but at least its economy was growing faster and the gap was quickly reduced over time. Had the process of fast growth in Greece continued, it would have led the Greek economy to converge with the European economies (in per capita terms) shortly after the end of this century. However, in the 1970s the speed of convergence slowed down, and in the 1980s Greece was diverging from the other European economies in terms of per capita income. It is only recently, during the second half of the 1990s that Greece has overtaken the average growth pattern in the EU and, thus, the prosperity gap with the other european states started shrinking again. A

substantial impetus of this growth has been transmitted through CSF actions, and it is precisely for this reason why the analysis and the understanding of its impact and potential matters for assessing the course of the Greek economy.

Naturally the first thing one needs to explain is the gradual decline of postwar growth in Greece. There is abundant evidence suggesting that the main factors of decline were the systematic fall of investment, the deterioration and inadequacy of infrastructure, and the lack of extensive training in new technologies and skills, all of them combined with the slowness of institutional reforms in critical areas of economic activity and policy. Thus, the country was not sufficiently prepared to face the lasting consequences of shocks in energy prices in the 1970s, the increasing openness to european and world competition in the 1980s and, recently, the challenges of the Single European Market.

The CSF aims precisely at assisting the country to rectify some of those structural deficiencies. The Plan of the CSF was for years negotiated between the Greek government and the European Commission, before being been approved in July 1994. It envisaged the following main interventions:

- *raise the provision and quality of public infrastructure*
- *support fixed capital formation by the private sector*
- *boost competitiveness of the production sector*
- *improve efficiency and adequacy in education and specialised training*
- *technologically modernise the civil service*
- *foster regional development*

The extent of CSF interventions amount to no less than M∈ 32,782 over a six-year period, a sum that represents an increase of 146% over the total first CSF implemented during 1989-93. The size of the Plan is so enormous, that necessitates continuous monitoring of its implementation and extensive evaluations of the outcome, both at the level of individual actions as well as at the macroeconomy. Since the Plan involves several infrastructural and horizontal interventions, spillovers to other sectors and areas of economic activity are going to be substantial.

Our main concern is to assess the impact of CSF on growth and employment, as they are rightly considered to be the most critical factors in judging the progress of a country and its *real* convergence toward the most advanced economies of EU. Their assessment requires a careful quantification of the outcome is likely to have on the industry-wide and macroeconomic level, taking into account both demand and supply side effects.

This assessment is quantified by employing a four-sector macroeconometric model for the Greek economy that portrays the main interactions between the components of demand and supply together with the effects that infrastructure building has on growth, employment and the

environment. An econometric model is a useful tool for such an analysis as it describes the basic structure and interrelationships in the economy. Although macroeconomic models have been frequently criticised for reflecting the structure of the past and, therefore, are unable to capture possible breakthroughs in the future, they still provide the most extensive and consistent quantitative framework for analysing plausible developments. Such a model can generate forecasts of the alternative course that the economy would have taken with or without such a type of interventions.

Furthermore, an increasingly critical factor for the quality of growth, is the environment. Currently, there is an intense world-wide discussion on restricting polluting emissions, and various policy schemes (such as setting permission levels or imposing taxation) are considered in EU. It is therefore essential to examine how CSF is affecting the energy consumption in Greece, and what the effects of environmental taxation might be. This is taking place by integrating a model of energy demand within the sectoral model, so that all interactions are properly taken into account.

The book is organised in five chapters, which deal mainly with the policy issues, avoiding all unnecessary technical complications. The model is extensively analysed in the Appendix, while a number of figures and tables provide the qualification of the policy analysis.

Chapter 1 gives a brief account of the problems and characteristics of the Greek economy during the last 25 years, and portrays the successive phases of growth and stagnation. Attention is paid to the structure of the labour market, the mechanism of wage setting and the role of infrastructure in inducing investment. The chapter includes the most recent surge of growth that Greece is enjoying in its way to EMU, which is expected to be completed in year 2000. The issue is, of course, how the pendulum of growth does not take another swing to stagnation, and to this aim the role of upgrading and extending infrastructure is critical.

Chapter 2 investigates the effects that a publicly provided infrastructure is likely to have on the performance of the private sector. More specifically, it is established that there exists a strong positive link between infrastructure and productivity in Greece. These findings are in line with international empirical evidence, according to which public capital formation plays a crucial role in the growth process of a country.

Coming to the point, the chapter gives a synoptic discussion of the interventions offered by the Structural Funds and the CSF for Greece. The actions envisaged by CSF are consolidated to four main types of intervention, namely those aiming to raise physical infrastructure, the soft infrastructure interventions, the aid to productive investment and, finally, the group of education and training actions. By doing so, the empirical estimation of their macroeconomic effects is facilitated.

Chapter 3 describes the new model on which our assessment of CSF is based. The model contains four sectors of economic activity, namely those of agriculture, traded goods, non-traded goods and the public sector, and includes a detail system of price formation, wage setting and public finances. Employing this model, a base forecast is obtained under certain assumptions for the period 1995-2005 in order to have a benchmark of what the economy would have been without the CSF. To this end, we describe a likely course for the exogenous variables of the model, the institutional changes likely to be implemented, and the stabilisation targets that the government has adopted, regardless of CSF, in order to reduce the debt burden and qualify for the convergence criteria of the Maastricht Treaty. The model is also subjected to a number of stylised shocks in domestic and international variables, and the dynamic properties and multipliers of the economy are analysed.

Chapter 4 describes the financial flows of each category of CSF as being outlined in Chapter 2. A framework of supply-side responses to those interventions is introduced, to express the means by which infrastructure building may generate growth and raise productivity. Employing the sectoral macroeconometric model we then assess the impact of CSF actions on the Greek economy. This is taking place by constructing projections of main economic variables under the assumptions of CSF, and then comparing the outcome with the benchmark of no CSF intervention. The effects of CSF are modelled in a two-fold manner. First, the CSF flows are assumed to solely push total demand, through domestic expenditure and personal income, and this is meant to be the demand-driven scenario. Second, a boost in domestic supply is examined through the rise in sectoral productivity due to improved infrastructure, reduction of unit labour costs and increase in capital formation. The supply-side scenario is quantified by calibrating a number of parameters on productivity externalities, generated by the new infrastructure. The model is then simulated for each type of intervention and under alternative assumptions according to whether the effects are stemming from the demand side of the economy or incorporate the supply-side responses. Changes in output and productivity growth rates, the rise in employment, and the developments in prices and public finances are analysed first separately for each intervention and then for the total of CSF actions.

Chapter 5 deals with the energy sector and the environment. Environmental effects are closely linked to developments in energy demand. Special attention is recently paid to the need of decreasing of carbon dioxide (CO_2) and other 'greenhouse' emissions that primarily arise from the consumption of energy. We describe the key characteristics of energy consumption in Greece and derive estimates of energy demand for the traded, non-traded, public, and agricultural sectors. We then

integrate the energy demand and the energy price system into the macroeconomic model and obtain alternative scenaria. First, we extend the base forecast to include energy demand under the same key macroeconomic assumptions adopted in Chapter 4, without any CSF interventions. Then, the demand for energy under CSF is forecasted, again according to whether it is only demand-driven or generates positive supply-side effects. The model is then subjected to a number of policy simulations which involve a rise in energy prices in the form of an energy tax under the assumption of fiscal neutrality. Based on the forecasts of energy demand, we derive the CO_2 emissions for the period up to 2012, which is the terminal year of the internationally agreed period 2008-2012 for environmental action.

In particular, we focus on changes in CO_2 emissions brought about by the CSF. One of the major CSF interventions in Greece is the introduction of natural gas to the Greek energy system, and so we examine the effects under alternative environmental scenaria that incorporate the two main features of interest: the group of actions and initiatives incorporated in the CSF and the impact of introducing natural gas in the energy sector. In general, we find that the average annual growth rates of predicted CO_2 emissions for the period 1995-2012 are higher than world forecasts. However, the implementation of the third phase of the CSF (expected to begin in 2000) will enhance flexibility and competitiveness of the Greek energy system by setting priorities for the energy sector. It is therefore expected to drive CO_2 emissions to a much lower level by the year 2012.

The *Epilogue* summarises the results of the study, discusses the main conclusions and presents a number of policy implications concerning the implementation and evaluation of CSF in recipient countries and the new prospects of the Greek economy.

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