The Effects of the Second Community Support Framework 1994–99 on the Greek Economy

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The purpose of this paper is to provide an ex ante assessment of the effects that the second Community Support Framework (CSF) is likely to have on the economy of Greece in the short and medium run by employing the projections of a four-sector annual macroeconometric model. The model is simulated under alternative assumptions accordingly to whether the effects are stemming from the demand side of the economy or incorporate the supply-side externalities that show the improvement of factor productivity by CSF actions. In the absence of externalities, output rises during the period of the CSF 1994–99, but then returns to the benchmark course without any lasting improvement. When externalities are taken into account, total output in year 2010 will be higher than baseline by an impressive 9.5 percent, and will continue to grow at a rate faster by 0.26 percent per annum than would be otherwise. Over the period of simulation the output growth rate averages above the benchmark rate by 0.55 percent per annum, and employment expands by an average of 95,000 new jobs. This finding has serious implications for the allocation, implementation, and monitoring of the Plan, because it calls for actions that ensure the maximum possible efficiency if a lasting improvement is to occur in the economy. © 2000 Society for Policy Modeling. Published by Elsevier Science Inc.

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1. INTRODUCTION

The purpose of this paper is to provide an *ex ante* assessment of the effects that the second Community Support Framework (CSF) is likely to have on the economy of Greece in the short and medium run. The Greek CSF is designed to finance large scale development projects and investment in physical and human capital, aiming to gear the economy of Greece onto a sustainable path of economic growth and development. As for the other main recipient countries of European Union (Ireland, Portugal, and Spain), such an intervention has been deemed necessary to assist the less-developed members of the Union to modernize their economies, foster growth, and therefore, approach the welfare and efficiency of the most developed members of the Union. This process of *real* convergence is viewed as a prerequisite for the cohesion of EU and the sustainability of the *nominal* convergence objective of the Maastricht Treaty in the way to Economic and Monetary Union (EMU) of Europe. The second CSF will be operational during 1994–99, and is going to be substantially more extensive in actions and far-reaching in impact than the first CSF implemented in 1989–93.

There is abundant evidence that the main factors of the decline in growth observed in Greece after 1973 have been the fall of investment (Alogoskoufis, 1995), the deterioration and inadequacy of infrastructure, and the lack of extensive training in new technologies and skills. Combined with the slow process of institutional reforms in critical areas of economic activity and policy, the country was not sufficiently prepared to face the lasting consequences of the shocks in energy prices in the seventies, the increasing openness to world competition in the eighties, and the challenges of the Single European Market. The CSF aims precisely to assisting the country to rectify those structural deficiencies and put the economy on a path of sustainable growth. CSF interventions amount to no less than Mecu 32,782 over a 6-year period, a sum that represents an increase of 146 percent over the total first CSF implemented in 1989–93 (with the amounts adjusted on the basis of annual flows, the increase becomes 64%). The size of the program is so enormous, that it 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. Because the Plan involves several infrastructural and horizontal interventions, spillovers to other sectors and areas
of economic activity are going to be substantial. Their assessment requires a careful quantification of the outcome it is likely to have on the industry-wide and macroeconomic level, taking into account both the demand and supply side effects.

A useful tool for such an analysis can be an estimated macroeconomic model that portrays the basic structure and interrelationships, and generates forecasts of the alternative course that the economy may take with and without such a type of interventions. Although macroeconomic models are frequently criticized for reflecting the structure of the past and, therefore, are unable to capture possible breakthroughs in the future, they still provide a consistent and quantitative framework for analyzing plausible developments. Using a four-sector estimated model for the Greek economy, the present study attempts to assess the impact of CSF actions on the macroeconomy by constructing projections of main economic variables under the assumption of full utilization of the funds and then compare the outcome with the benchmark case of no intervention.¹

The structure of the paper is the following: The modeling of CSF is described in Section 3. In Section 4, the model is simulated under alternative assumptions accordingly to whether the effects are stemming from the demand side of the economy or incorporate the supply response as well. After the analysis of results, conclusions and directions of future research are discussed in Section 5.

2. MACROECONOMIC ANALYSIS OF CSF

2A. Accounting for CSF

Each flow of CSF is characterized by two attributes: (1) the proportion, which is expected to be implemented in period \( t \), and, (2) the ratios of financial contribution from European Union, National Authorities, and the private sector. An amount of \( S \) Meu that is allocated to a specific sector for the whole period will generate the following annual flow \( F_t \) in constant 1970 Drachma billion:

\[
F_t = S \cdot T_t \cdot (X_t / P_t) \cdot (\alpha + \beta + \gamma). \tag{1}
\]

In Equation 1, \( T_t \) is the proportion to be allocated in period \( t \), \( X \) is the prevailing nominal exchange rate in Drs/Ecu, \( P \) is the

¹For a detailed presentation of the econometric specification of the model, the projection results and the simulation properties, see Christodoulakis and Kalyvitis (1994, 1995).
Table 1: Intertemporal Absorption Ratios of CSF

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>0.05</td>
<td>0.13</td>
<td>0.16</td>
<td>0.18</td>
<td>0.18</td>
<td>0.18</td>
<td>0.12</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Notes: Figures are based on preliminary estimates of the CSF absorption rates.

GDP deflator normalized to have $P(1970) = 1$, and $\alpha$, $\beta$, and $\gamma$ denote the cofinancing ratios of EU, Government, and private sectors, respectively, with $\alpha + \beta + \gamma = 1$. For an analytical description of the various cofinancing ratios that are calculated on the basis of the relative amounts by type of intervention, see Christodoulakis and Kalyvitis (1995).

The time schedule depends crucially on the readiness of the economy to absorb the flows from the Union, and also on the availability of domestic financial resources. Both are expected to improve over time, and for this reason factor $F_t$ increases during 1994–99. As has happened in the first CSF program, several projects are completed with some delay, and final payments come after the planned horizon. To capture this predictable delay, the time factor is extended to year 2000 and the intertemporal allocation is assumed to be as in Table 1.

Each flow is modeled in such a way as to reflect both the increase in the benchmark level of relevant investment and the consequential burden for the public and private sector. The equations of the model that are modified to account for the CSF flows are listed below (Equations 2–12). The expression that appears in the rhs of each equation with the suffix $base$ denotes the function of explanatory variables or the exogenous values that have been used in the benchmark forecasting. The notation of CSF flows uses the prefix $F$ and the name of the corresponding variable.

Investment in agriculture:

$$QIA = QIA_{base} + FQIA,$$

Investment in the traded sector:

$$QITR = QITR_{base} + FQITR,$$

Investment in the non-traded sector:

$$QINT = QINT_{base} + FQIH + FQIS.$$  

This equation includes the investment in hard infrastructure ($FQIH$) and the investment in soft infrastructure ($FQIS$) that mainly concerns activities in the non-traded sector.
Public investment:

\[ QIG = QIG_{base} + (\alpha + \beta)FQIH + (\alpha + \beta)FQIS + \beta FQIA + \beta FQITR. \]  

(5)

This equation assumes that the infrastructure investment will be of public property, regardless of whether it has been financed by community or national government funds. Public investment also includes the cofinancing of investment in agriculture and industry. Variable QIG is then used in the model to determine the accumulation of the new public capital stock.

Public deficit:

\[ DEF = DEF_{base} + \beta FQIH + \beta FQIS + \beta FHUM + \beta FQIA + \beta FQITR. \]  

(6)

Public deficit DEF increases by the amount of public cofinancing of all sorts of investment and also by the public contribution to the human capital training (note that the sums appearing in the deficit equation are different from those entering the public investment flow).

Private investment:

\[ QIP = QIA + QITR + QINT + QIPS - QIG. \]  

(7)

This equation determines the privately owned investment flows by subtracting from all sorts of investment those of the public sector. Variable QIP is then used in the model to determine the evolution of total private capital stock that enters in the definition of public sector wealth in the consumption function (see Christodoulakis and Kalyvitis, 1994).

Private sector financial wealth:

\[ \Delta QFWP = (\text{interest}) + (\text{savings}) - \gamma FQIA - \gamma FQITR, \]  

(8)

where the expressions in brackets denote the functions of interest payments and savings, respectively, and \( \Delta \) is the first difference operator. Savings are now reduced by the amount that the private sector has to contribute to the realization of investment in agriculture and industry. However, the reduction of private savings are more than compensated by the increase in private investment flows. Assuming that apart from the government-financed part, investment in the traded and agricultural sectors remains in the private sector, the increase in private investment is easily worked out from Equations 2, 3, 4, 5, and 7 to be:
\[ QIP - QIP_{\text{base}} = (\alpha + \gamma)^*FQIA + (\alpha + \gamma)^*FQITR + \gamma^*FQIH + \gamma^*FQIS, \]

(9)

The disposable income that enters the consumption function is augmented by the amount FHUM spent on training either in the form of remuneration to trainees or a fee to the trainers.

Disposable income:

\[ YDIS = YDIS_{\text{base}} + FHUM. \]

(10)

Additionally, to the above equations, we introduce two accumulation equations for the hard and soft infrastructure to assess the improvement of the capital stocks relative to the benchmark forecasting. Using the simple neoclassical accumulation process, we have:

\[ QKH = (1-\delta)QKH_{-1} + QKH_{\text{base}} + FQIH \]

(11)

\[ QKS = (1-\delta)QKS_{-1} + QKS_{\text{base}} + FQIS \]

(12)

where QKH and QKS are the stocks for hard and soft infrastructure, respectively, and \( \delta \) is the depreciation rate.

2B. Modeling CSF Externalities

CSF actions are going to influence the economy through a multitude of supply-and-demand effects. Demand effects are captured by the appropriate rise in the components of domestic expenditure or personal income, as has been described in the previous subsection. The supply side effects will come by the rise in sectoral productivity due to the improved infrastructure, the reduction of cost due to the better training of the labor force, and the increase in fixed capital formation in the productive sectors as community and public aid will induce private investment.

The positive impact of infrastructure on output and productivity growth has been investigated in an increasing number of studies for various economies. Ratner (1983) was the first to obtain a quantitative assessment for the U.S. economy. A few years later, Aschauer (1989a), in a cross-country study, examined the productivity growth in the G7 economies in association with the aggregate stock of public infrastructure invested in those countries, and suggested that a 1 percent increase in public capital as a ratio to GNP would be associated with a 0.5 percent rise in the growth
The role of public infrastructure is also examined in the context of endogenous growth models. For example, Barro (1990) considers the flow of government expenditure on social infrastructure as a factor of production, and finds that the steady state growth rate in the economy increases with the national income share of investment in infrastructure. Aschauer (1993) developed an endogenous growth model with the stock of public capital as a production factor, and employs it to explain regional differences in the growth rates.

For the Greek economy, it has been shown that public infrastructure has a positive and strong impact on the productivity of large-scale manufacturing, and established\(^3\) that public infrastructure can be treated as a factor of production (Christodoulakis and Kalyvitis, 1996). Using a cyclically adjusted capital stock to account for the changes of utilization over the business cycle, the long-run elasticity of output in the manufacturing sector with respect to public infrastructure was found to be 0.60. Similar results were found by estimating a translog production function for the same sector of large-scale manufacturing (Christodoulakis and Segoura, 1996).

Having established the positive impact of infrastructure on output, the next step is to calibrate some new parameters in the estimated model to study the economy-wide effects. In an econometric model, such as the one employed in this paper, the effect of infrastructure and human capital improvement can be analyzed by introducing a number of externalities in the estimated equations for output and production costs (Equations 13–21). Externalities are modeled in a way similar to that suggested by Bradley et al. (1995) for the Irish and Portuguese economies, so that results are directly comparable between various CSF recipient countries.

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\(^2\) Employing a Cobb–Douglas production function, Aschauer (1989b) had established that the decline in U.S. productivity growth in the 1980s is associated with the neglect for public infrastructure over the same period. Similar results have been obtained by Garcia–Mila and McGuire (1992) and Costa de Silva, Ellson, and Martín (1987) for U.S. Bajo–Rubio and Sosvilla–Rivero (1993) for Spain, and Ford and Poret (1991) for the major OECD economies.

\(^3\) Taking into account the criticism by Tatom (1991) against the aforementioned approaches, the estimation took place by employing cointegration techniques for nonstationary time series, and testing for the existence of Granger causality from infrastructure to productivity and not vice versa.
Externality elasticities are calibrated in such a way as to take into account the elasticities that have been estimated at the large-scale industry level. The supply side effects for the various types of CSF actions is described as follows.

**Hard infrastructure:** output in each of the four sectors is given by a production function of the form

$$Y_s = \bar{A}_s f(K_s, L_s, t),$$

where suffix $s$ ($s = T, N, G, A$) stands for the traded, non-traded, public, and agricultural sector respectively, $K_s$ and $L_s$ are the sectoral capital and labor inputs, $t$ is technological progress, $A_s$ is a scale parameter. The bar indicates the estimated value used in the nonexternalities simulations. The infrastructure externality is modeled by endogenising the latter as:

$$A_s = \bar{A}_s \left(\frac{QKH}{\bar{QKH}}\right)^{h(s)},$$

where $QKH$ is the accumulated stock of hard infrastructure, the bar indicates the stock in the no-externality case, and $h(s)$ denotes the externality elasticity for each sector with respect to $QKH$. In logarithmic terms, the affected equations are written as follows:

$$\ln Y_s = \ln Y_s(\cdot)_{base} + h(s)\ln(1 + \Delta QKH/QKH),$$

where $Y_s(\cdot)_{base}$ denotes the function used in the non-CSF simulations. Externality effects are assumed to vary across sectors. The traded sector is assumed to be the readiest to incorporate the improvement of hard infrastructure into production, by means of energy savings, better transport, communication, etc. The non-traded and public sectors also benefit from hard infrastructure, but to a lesser extent, reflecting the lower capital intensity. The agricultural sector is assumed to benefit the least, given its slow adaptation to new technologies. Parameter values were chosen to be 5 percent for the traded sector, 2.5 percent for the non-traded and public sectors, and 1 percent for agriculture. The capital stock of hard infrastructure accumulates according to the process described by Equation 11.

**Soft Infrastructure:** soft infrastructure actions will improve the social and cultural environment, enhance technological and educational capabilities, and bridge regional discrepancies by a multitude of local interventions. To capture the supply side effect we assume that unit labor cost will improve in real terms. The augmented equation becomes:
QULC = QULC_{base}(QKS/QKS)^{\sigma(c)}, \quad (16)

where QULC is real ULC, QKS is the capital stock of soft infrastructure, and \( \sigma(c) \) is the elasticity with respect to changes in QKS. QULC_{base} denotes the function of unit labor cost used in the nonexternalities case and QKS denotes the capital stock without the CSF intervention. Elasticity \( \sigma(c) \) is set equal to \(-2\) percent.

To a considerable extent, actions of soft infrastructure involve the public sector. Thus, it is reasonable to assume that public employment will increase above the level assumed in the benchmark scenario, as follows:

\[
LPS = LPS_{base}(QKS/QKS)^{\sigma(e)}. \quad (17)
\]

In the above expression, LPS is public sector employment, and \( \sigma(e) \) is the elasticity to changes in QKS. The increase in public employment will automatically raise public sector activity; thus, there is no need to add another elasticity for output. The elasticity \( \sigma(e) \) is set equal to 10 percent. The capital stock of soft infrastructure accumulates according to the process described by Equation 12.

**Productive Investment**: investment aid to manufacturing and agricultural sectors affect explicitly the capital stock and output in those sectors. Hence, there is no need to consider further supply side effects stemming from such actions.

**Education and Training**: The effect of human resources fund that is used for training activities is measured by the extent it raises the employment of skilled workers. To assess the number of skilled workers that will be added to the labor force we employ a calculation similar to that of Bradley et al. (1995). Each trainee is assumed to receive a fraction \( \mu \) of the wage rate in the non-traded sector (WNT), while instructors are remunerated the full rate, and each of them trains a group of M people. The annual bill is given by:

\[
FHUM*P = NHUM*(\mu*WNT) + (NHUM/M)*WNT, \quad (18)
\]

where FHUM is the annual CSF intervention for training (expressed in constant 1970 prices), P is the GDP deflator and NHUM is the number of trained workers per year. Inverting Equation 18 we obtain:

\[
NHUM = FHUM*P/((\mu + 1/M)*WNT. \quad (19)
\]

Trained workers are added to the stock of skilled workers (QHUM) according to the accumulation process:
Table 2: Parameter Values for Externality Elasticities

<table>
<thead>
<tr>
<th></th>
<th>Hard infrastructure</th>
<th>Soft infrastructure</th>
<th>Human resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traded output</td>
<td>$\eta_T = 0.05$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-traded output</td>
<td>$\eta_N = 0.025$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public output</td>
<td>$\eta_G = 0.025$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public employment</td>
<td></td>
<td>$\sigma(e) = 0.10$</td>
<td></td>
</tr>
<tr>
<td>Agricultural output</td>
<td>$\eta_A = 0.01$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real unit labor cost</td>
<td></td>
<td>$\sigma(c) = -0.02$</td>
<td>$\theta = -0.03$</td>
</tr>
</tbody>
</table>

Notes: $\eta_T$, $\eta_N$, $\eta_G$, and $\eta_A$ denote the elasticities of the tradable, non-tradable, public, and agricultural sector, respectively.

\[ Q_{HUM} = (1 - \epsilon)Q_{HUM, t-1} + NHUM, \quad (20a) \]

where $\epsilon$ is a depreciation rate set equal to 5 percent annum. A data series for $Q_{HUM}$ in the non-CSF simulations has been constructed by assuming that only half of existing employment is composed of skilled workers, that is:

\[ Q_{HUM, base} = \xi(LA + LTR + LNT + LPS), \quad (20b) \]

where $\xi$ is set equal to 0.50. The expected effect of the increase in skilled human resources is the improvement of labor productivity. To model this externality, we assume that unit labor cost in real terms changes in a way similar to that for the soft infrastructure interventions:

\[ QULC = QULC(\cdot)_{base}(Q_{HUM}/Q_{HUM})^\theta, \quad (21) \]

where $\theta$ is the elasticity with respect to $Q_{HUM}$, and other definitions are similar to those in Equation 16. The parameter value was set equal to $-0.03$ percent. The externality elasticities to the various types of CSF intervention are summarized in Table 2.

3. ASSESSING THE MACROECONOMIC IMPACT OF CSF II

The model is simulated to assess two types of macroeconomic impact, depending on whether the externality effects described in the previous section are absent or fully realized. In the first case, the simulation results are “partial,” as they depict only the demand effects of CSF actions. In the second case, results describe the
Table 3: Effects of CSF II in Greece

<table>
<thead>
<tr>
<th>Year</th>
<th>Y (**)</th>
<th>GRY (*)</th>
<th>GRPL (*)</th>
<th>L (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Part</td>
<td>Full</td>
<td>Part</td>
<td>Full</td>
</tr>
<tr>
<td>1994</td>
<td>1.09</td>
<td>1.23</td>
<td>1.11</td>
<td>1.25</td>
</tr>
<tr>
<td>1999</td>
<td>4.77</td>
<td>4.77</td>
<td>-0.27</td>
<td>0.70</td>
</tr>
<tr>
<td>2005</td>
<td>2.45</td>
<td>2.03</td>
<td>0.53</td>
<td>0.83</td>
</tr>
<tr>
<td>2010</td>
<td>1.53</td>
<td>9.53</td>
<td>0.11</td>
<td>0.26</td>
</tr>
<tr>
<td>Avg</td>
<td>2.57</td>
<td>7.70</td>
<td>0.10</td>
<td>0.55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>DY (*)</th>
<th>LFNA (*)</th>
<th>UUR (*)</th>
<th>INFY (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Part</td>
<td>Full</td>
<td>Part</td>
<td>Full</td>
</tr>
<tr>
<td>1994</td>
<td>0.37</td>
<td>0.38</td>
<td>1.91</td>
<td>2.20</td>
</tr>
<tr>
<td>1999</td>
<td>0.02</td>
<td>1.09</td>
<td>10.38</td>
<td>30.8</td>
</tr>
<tr>
<td>2005</td>
<td>1.11</td>
<td>1.04</td>
<td>6.06</td>
<td>62.0</td>
</tr>
<tr>
<td>2010</td>
<td>-0.36</td>
<td>-0.26</td>
<td>5.76</td>
<td>86.3</td>
</tr>
<tr>
<td>Avg</td>
<td>0.10</td>
<td>0.45</td>
<td>6.20</td>
<td>44.9</td>
</tr>
</tbody>
</table>

Notes: The column “part” displays simulation results without any externality effect, and column “full” the results with externalities taken into account.

An asterisk indicates difference from baseline, two proportional change. Y is output at factor cost, GRY the growth rate of output, GRPL the growth rate in labor productivity, L total employment in thousands, DY primary deficit as a percentage of GDP, LFNA is nonagricultural labor supply in thousands, UUR is the rate of urban unemployment, and INFY the inflation rate of GDP deflator.

“full” impact of CSF stemming from both the demand side and the externality effects. The results are displayed in Table 3.

The overall CSF will affect the economy through the cumulative impact of the separate actions. In the absence of externalities, output will rise by roughly 4.0 percent during the period of CSF.

It should be noted that besides the distinction between demand and supply-side effects, another crucial assumption is made about the course of stabilization policy. As discussed in subsection 24, we assume that during the implementation of CSF the Convergence Plan continues unabated and achieves the same debt-to-output targets as projected in the benchmark scenario. This is ensured by employing a simple fiscal rule, according to which the direct tax rate is risen until a specified debt target is met in each period. Under this assumption, no change will occur in the debt burden or the gross public deficit as a consequence of CSF actions. The changes will appear now in the primary deficit that is upwards influenced by the cofinancing obligations of CSF and downwards by the increased revenues generated by the higher tax base.

The effects of each action are reported in Christodoulakis and Kalyvitis (1995).
actions, but then will improve by only 1.5 percent of benchmark levels, mainly due to the impact of productive investment. Growth rates of output and productivity will be returning to the base levels. The wage increases associated with the boom will have raised the participation rate, and at the same time some jobs will be gained. Unemployment rate may slightly rise after a period of containment in the years of CSF.

When all types of externalities are taken into account, total output in year 2010 will be higher than baseline by an impressive 9.5 percent and—more importantly—will continue to grow at a rate faster by 0.26 percent per annum. Over the period of simulation the output growth rate averages above baseline rate by 0.55 percent per annum. During 1994–99 the growth rate rises by around 1.2 percent higher than the rate projected by the official CSF Plan for the same period. Employment expands by an average of 95,000 new jobs, which is close to the figure officially expected.

4. CONCLUSIONS

Based on an estimated model of the Greek economy, the paper investigated the impact that interventions of the Community Support Framework 1994–99 is likely to have on the economy of Greece. CSF actions were grouped according to whether they aim to (1) raise “hard” infrastructure, (2) finance “soft” infrastructure interventions, (3) support productive investment, and, (4) train the labor force into new skills and improve the civil service. The effects were analyzed first, assuming that CSF operates only through raising the components of income and aggregate demand, and then by incorporating externalities on the productivity of output in various sectors and the reduction in costs.

The universal conclusion is that, in the absence of externalities, CSF actions produce only a temporary rise in activity and employment, and, after the implementation period, the economy returns to the course that would have been the case without the funds. A permanent rise in growth, activity, and employment is achieved only with CSF externalities. Such a conclusion may not be seen as surprising, given the disappointing experience of the first CSF 1989–93. Being allocated mainly to a multitude of small-scale projects and uncoordinated actions, and driven mainly by the haste to absorb funds the first CSF had few lasting effects. The economy grew faster in 1990 and 1991, but then activity slackened.
A similar picture emerges as a possible outcome for the second CSF if the effects are left to operate only through the demand side. However, if externalities are assumed to operate even at a moderate scale, the picture changes starkly. Total output will be rising for a long period of time, and 10 years after the end of CSF will still be 9.5 percent higher than baseline. The economy will still be growing at a rate faster by 0.26 per annum, after having achieved an incremental increase of 0.55 percent per annum in average for a period of 15 years. Productivity, employment, and the exporting capacity of the country will improve accordingly. This finding has far-reaching implications for the allocation, implementation, and monitoring of the Plan, because it calls for actions that ensure the maximum possible efficiency if a lasting improvement is to occur in the economy. National and EU authorities should make sure that the following conditions are satisfied to achieve the effect of externalities envisaged in the ex ante analysis of CSF: (a) design, construction and operation of hard infrastructure projects after a careful examination of the benefits that are going to accrue to the various sectors of economic activity. The hard infrastructure actions of the regional programs should be implemented in conjunction of the national-scale ones so that complementarity rather than repetition is achieved. (b) The implementation of soft infrastructure actions should take into account the demand that is likely to develop for such services (e.g., R&D, culture, health, etc). The concentration on top-down activities that cannot attract substantial demand from the production and service sector should be avoided. (c) Training and education should be geared to providing skills in current and future demand by the economic activities, so that their effect is felt on improving the productivity of the human factor. (d) The implementation of the program should ensure that all envisaged cofinancing by the private sector is realized, so that the maximum impact on investment and infrastructure utilization is achieved.

The analysis in this paper is, of course, tentative and limited, not only because of its ex ante character, but also because of the limitations of the model. Thus, several further steps should follow. First, the model itself should be further examined in its policy implications, tested in a greater number of multipliers, and improved by new estimation of equations as data become available. Also, the simulations of the model can be compared to microeconomic or industry-wide studies of the Greek economy, in which
a more precise evaluation of the externalities effects can be obtained.

REFERENCES


