

The Contribution of Administrative Credit Controls to Greek Industrial Sector Capital Asset Formation

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Abstract

This article analyses the effects of Selective Credit Policies (S.C.P.'s), pursued by greek monetary authorities over the period 1968 - 1987, on industrial business behaviour. Selective Credit Policies comprise the exogenous determination of the volume and structure of bank lending, as well as of the levels and term structure of interest rates. Business behaviour as reflected in decisions affecting investment in plant and equipment, on the one hand, and liquid assets, on the other. Liquid assets include inventories, credit to customers and cash accounts.

The conclusion of this study is that the S.C.P.'s, although might have played some positive role in channeling long - term funds to industrial firms, they did not succeed in making any considerable contribution to capital asset formation. Conversely, the impact of investment inducing fiscal policies was proved to much stronger. Additionally, the combination of centrally administered nominal interest rates and high inflation rates that prevailed in the period under review, seriously limited any success of S.C.P.'s in achieving the goals of promotion investment activity and the growth of industrial output.

I. Selective Credit Policies and their Application in Greece

Reasons for the implementation of S.C.P.'s exist within either perfect market conditions (D.C. Rao, 1972) or within imperfect market conditions as is usually the case in developing economies. In addition there is a group of economies, the Greek economy is one of them, where, due to the underdevelopment of the capital markets, the banking systems, usually of monopolistic or oligopolistic character, are the major vehicles for the recycling of savings in the economy and the main transmission channels of monetary policy. The regulation of markets through monetary policy is being implemented via the use of quantitative restrictions in the total credit expansion on the one hand, and qualitative measures to influence the distribution of credits on the other.

The present analysis focuses mainly on S.C.P.'s which imposed on greek commercial banks as well as on their effectiveness with regard to influencing industrial financing. S.C.P.'s which were implemented in Greece during the period under review comprise two basic forms of measures : a) measures to influence the distribution of credit to various sectors and economic activities aiming at directing bank funds to more productive applications, e.g.

mainly to manufacturing, b) controls upon interest rate levels (ceilings) by category of loans with the aim of making credits readily available to desirable uses, due to their lower financial cost (e.g. long-term loans).

II. Flow - of - funds Analysis

To check the validity of the theoretical approach of this paper, we proceeded with an analysis of the changes of the sources and uses of funds (at constant prices) of a sample of industrial firms, during the period 1968-1987 (Table 1).

The basic conclusions which are derived from this study of inflows and outflows of funds are the following : (a) Net investments not only did they not show any increase, over the period under review, but, on the contrary, they dropped. Only gross investments, which include depreciations, increased in this period. (b) Long term bank loans (BFL) experienced a much more extensive decline than that of net investments. (c) There is evidence of a marked maturity mismatch of the sources and uses of funds, reflecting the overall tendency on the entrepreneurs, to finance increases in short - term placements form long -

Table 1
Real sources and uses of funds (1968-1987)

| USES OF FUNDS | | | | | | | | SOURCES OF FUNDS | | | | | | | |
|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 1968 1972 | 1973 1977 | 1978 1982 | 1983 1987 | 1968 1987 | 1978 1987 | 1968 1977 | | 1968 1972 | 1973 1977 | 1978 1982 | 1983 1987 | 1968 1987 | 1978 1987 | 1968 1977 |
| GFA | 12.8 | 4.0 | 11.0 | -15.6 | 12.2 | -4.5 | 16.8 | TLTF | 13.5 | -4.4 | -0.9 | -4.7 | 3.5 | -5.6 | 9.1 |
| AM | -5.8 | -9.7 | -6.7 | 8.7 | -13.4 | 2.0 | -15.5 | | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| NFA | 7.0 | -5.7 | 4.3 | -6.9 | -1.2 | -2.5 | 1.3 | NW | (8.2) | (1.1) | (0.7) | (-2.0) | (8.0) | (-1.0) | (9.3) |
| | ----- | ----- | ----- | ----- | ----- | ----- | ----- | BFL | (4.9) | (-4.1) | (-2.2) | (-2.6) | (-4.0) | (-4.8) | (0.8) |
| LA | 13.9 | 7.5 | 1.0 | -1.1 | 21.2 | -0.2 | 21.3 | NBFL | (0.4) | (-1.4) | (0.6) | (-0.1) | (-0.5) | (0.5) | (-1.0) |
| | ----- | ----- | ----- | ----- | ----- | ----- | ----- | | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| INV | (5.8) | (5.7) | (0.2) | (-3.8) | (7.8) | (-3.7) | (11.5) | STF | 7.6 | 9.1 | 4.2 | -6.2 | 14.7 | -2.0 | 16.7 |
| CL | (7.1) | (1.6) | (1.1) | (2.6) | (12.4) | (3.7) | (8.7) | | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| CA | (1.0) | (0.2) | (-0.3) | (0.1) | (1.0) | (-0.2) | (1.1) | BFS | (5.0) | (6.8) | (6.2) | (-7.9) | (10.2) | (-1.6) | (11.9) |
| Others | 0.2 | 2.9 | -- | -2.9 | -- | -4.9 | 3.2 | NBFS | (2.6) | (2.3) | (-2.0) | (1.7) | (4.5) | (-0.4) | 4.8 |
| | ----- | ----- | ----- | ----- | ----- | ----- | ----- | Others | -- | -- | 2.0 | -- | 1.8 | -- | -- |
| | 21.1 | 4.7 | 5.3 | -10.9 | 20.0 | -7.6 | 25.8 | | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | | | | | | | 21.1 | 4.7 | 5.3 | -10.9 | 20.0 | -7.6 | 25.8 |

- GFA** = Gross Fixed Assets
AM = Amortization
NFA = Net Fixed Assets
LA = Liquid assets (INV + CL + CA)
INV = Inventories
CL = Claims (Accounts Receivable)
CA = Working Capital
NW = Own Capital
BFL = Banking long - term credit
NBFL = Non - banking long - term credit
BFS = Banking short - term credit
NBFS = Non - banking short - term credit
TLTF = Total long - term funds (NW+BFL+NBFL)
STF = Total short - term credits (BFS+NBFS)

term capital. (d) The percentage relation of liquid assets to sales (AL/CS) follows a continuous increase, to reach, by the end of the period (1984-87), levels double of those in 1968. This development, may be due to the tendency shown by many industrialists to divert their core business to various commercial activities, to extend excessive credit to their customers, or to accumulate inventories. (e) The participation of short-term funds in the total sources and uses of funds increased considerably while that of the long-term funds declined proportionately. Specifically, increases of investment in fixed capital at current prices, resulted mainly from internal sources of finance, that is mainly from depreciation and retained profits, and less from external loanable funds. This development was the result of the fiscal incentives policy (accelerated investment

depreciation rates, tax deductibility of reinvested profits) which was applied in order to boost investments.

The results of the flow - of - funds analysis point to the conclusion that credit policy failed to secure the channeling of the necessary resource to the formation of fixed capital. On the contrary, it facilitated the speculative activities of many firms leading to considerable distortions in the overall function of the greek credit system.

III. The Econometric Model

The objective of this section is to construct a model with the aim of testing the effectiveness of selective credit policies and their impact on business behaviour. The basic

concept is, of course, to design a model which will test the interactions between sources and uses of fund, that is to construct functional relationships between investments in fixed and working capital, on the one hand, and the financial inflows, on the other.

On the basis of the conclusions of the flow of funds analysis the theoretical model to be tested has the following form:

$$GFAt = f_1 (INVt, CLt, CA_t, ALCSt; X_1, \dots, X_n) \quad (1)$$

$$INVt = f_2 (GFAt, CLt, CA_t, ALCSt; X_1, \dots, X_n) \quad (2)$$

$$CLt = f_3 (GFAt, INVt, CA_t, ALCSt; X_1, \dots, X_n) \quad (3)$$

$$CA_t = f_4 (GFAt, INVt, CLt, ALCSt; X_1, \dots, X_n) \quad (4)$$

$$ALCSt = f_5 (GFAt, INVt, CLt, CA_t; X_1, \dots, X_n) \quad (5)$$

where:

$$X_1 \dots X_n = RS, RL, BFS, BFL, NBFS, NBFL, NW, CS.$$

The above five functional equations will explain the dependent variables GFA, INV, CL, CA (already defined) and ALCS which is the ratio of liquid assets (AL) to sales (CS). The independent variables are: the real short-term interest rate (RS), the real long-term interest-rate (RL), the short-term bank loans (BFS), the long-term bank loans (BFL), the non-bank short-term loans (NBFS), the non-bank long-term loans (NBFL), the own capital (NW) and the sales (CS). Compared to previous similar tests in international and greek literature this model is considered to be more effective since it comprises all the financial variables that constitute, from the supply point of view, significant determinants of business behaviour in capital formation and investment in liquid assets.

More importantly, by including equation (5) in the model we attempt to grasp important relationships existing between financial flows and production activity levels. It should be emphasized that production here is not viewed as an external predetermined force, but its level is considered to reflect the outcome of operational relationships between the financial and productive functions of the firm. This innovation forms a new contribution to the analytical framework of the S.C.P.'s and constitutes, on the basis of the empirical results to be derived, an enrichment of respective bibliography on the subject.

IV. The Empirical Results

The estimation of the equation in model (2) was made by Two-Stage-Least-Square (2SLS) method. All values of the variables in the test were taken in the form of annual increases. For their calculation initial figures were transformed to deflated form by the use of wholesale price index or investment deflator. The empirical results of the

model (2) are presented in Table 2. Variables BFL and BFS have been treated as exogenous since the tests for their endogeneity proved negative.

As far as the results of the econometric analysis are concerned, we observe that the empirical findings are satisfactory. As t-statistics show, most coefficients of the variables NW, BFS and BFL are significant. Almost all signs are the expected ones. The same is true for all interest rates with only one exception.

However, interest rate coefficients were not proved significant. This means that rate policy did not play any role in affecting investment decisions. This is easily understood since, during most of the period and especially during the second decade, a) the real interest rates were negative and b) this was accompanied by intense inflation and, as the flow-of-funds analysis showed, by a rise in commercial and non-productive activities of the firms.

On the other hand, an important positive finding is the high degree of explanatory power for each of the structural equations.

A basic conclusion, which can be drawn from the estimates which were obtained from the test, is the high level of dependency of the investments on self-financing. As it is clear from the investment equation there is a much stronger positive link between investment and own capital than between investment and bank credit. More specifically NW has a highly significant coefficient, whereas the coefficients of BFS and BFL are close to the acceptance level. An attempt was also made to test whether business behaviour, with regard to utilization of bank credit for investment purposes, did not differentiate between the two forms of finance but was affected mainly by total credit availability. Thus, we substituted in the investment equation the variable BF (total bank credit) to variables BFS and BFL. The same was done with total non-bank external finance (NBF). The results, shown in Table 3, prove that such a treatment increases the explanatory ability of the model as a whole. In particular they confirmed that total bank finance is significant for the business investment activity, more than the separate variables BFL and BFS in Table 2. Also, the equations for INV, CL and WK showed that there is considerable dependence of these variables on short-term bank credit.

Finally, the most striking result may be that of the equation prescribing the liquid-assets/sales ratio (ALCS). It is observed that the movements in wholesale price index had a very strong impact on this variable, as suggested by the high figure found for t-statistic. It is believed that this result reflects the sensitivity of firms in inflationary expectations as well as the intense uncertainty conditions

TABLE 2
2. SLS Estimates of Model (2)

| | Dependent Variables | | | | |
|------------------------------|---------------------|-------------------|-------------------|-------------------|--------------------|
| | GFA | INV | CL | CA | ALCS |
| Explanatory Variables | | | | | |
| GFA | -- | 0.617 (1.35) | -- | -- | -- |
| INV | -0.317 | -- | -0.319 (-1.47) | -0.719 (-1.85) | -0.601 (-1.68) |
| CL | -0.616 (-1.03) | 0.127 (1.44) | -- | -- | -0.281 (-1.54) |
| CA | -- | -0.316 (-1.72) | -- | -- | -- |
| ALCS | -0.791 (-1.45) | 0.648 (1.81) | 0.327 (1.493) | -- | -- |
| BFL | 0.516 (1.87) | 0.132 (2.47) | 0.312 (1.97) | -0.128 (-1.80) | -0.181 (-1.323) |
| BFS | 0.492 (2.17) | 0.747 (2.80) | 0.325 (3.17) | 0.618 (1.92) | 0.281 (1.29) |
| NBFL | 0.183 (0.42) | 0.071 (0.54) | -- | -- | -- |
| NBFS | 0.287 (1.12) | 0.647 (5.97) | 0.313 (1.88) | -- | -0.19 (-2.63) |
| NW | 0.793 (6.69) | 0.144 (4.94) | 0.212 (2.17) | 0.313 (2.28) | 0.283 (3.15) |
| RL | -0.023 (-1.67) | -0.037 (-1.72) | -0.068 (-1.13) | -0.074 (1.28) | -0.212 (0.35) |
| RS | -0.021 (-1.52) | -0.133 (-1.42) | 0.053 (1.06) | -0.715 (1.06) | 0.812 (1.27) |
| CS | -- | 0.086 (2.12) | 0.027 (2.47) | 0.033 (1.13) | -0.434 (-1.87) |
| WPI | -- | -- | -- | -- | 0.334 (4.68) |
| Constant | -5033 (-1.72) | 2033 (3.38) | 1025 (2.19) | 7402 (1.19) | 815 (2.19) |
| R ² | 0.91 | 0.96 | 0.83 | 0.87 | 0.97 |
| F statistic | 18.15 | 19.53 | 12.29 | 14.02 | 23.04 |
| D.W. Statistic | 1.77 | 1.97 | 1.91 | 2.03 | 2.07 |

R² is the unadjusted multiple correlation coefficient.

prevailed in the industrial sector, mainly during the period 1977-87, due to negative developments in general economic activity, slackness of the market and rapid increase of competition. This last incident, which to a great deal was related to the accession of Greece to the EEC (1981), forced many companies, to diversify in commercial activities and imports, sectors of higher profitability vis-a-vis manufacturing.

This finding underlines the "speculative" and "commercialized" characteristics of the industrial business behaviour during the last ten years of the period under

review. It also gives support to the argument that these developments should be considered responsible for the low-pace of investment activity observed over the same time interval.

V. Final Comments and Policy Implications

As essential conclusion of the econometric analysis is that business investment activity in Greece was mainly based on self-financing and less on acquiring long-term loans. Therefore, the credit policy (S.C.P.'s) failed to channel substantial funds to investments and was less

TABLE 3
2 SLS estimates of Model (2)

| | Dependent Variables | | | | |
|------------------------------|---------------------|-------------------|-------------------|-------------------|-------------------|
| | GFA | INV | CL | CA | ALCS |
| Explanatory Variables | | | | | |
| GFA | | 0.422 (1.57) | -- | -- | -- |
| INV | -0.228 (-1.84) | -- | 0.128 (-1.92) | 0.314 (2.82) | -0.418 (-1.49) |
| CL | -0.314 (-1.67) | 0.201 (1.64) | -- | -- | -0.314 (-1.81) |
| CA | -- | -0.402 (-1.83) | -- | -- | -- |
| ALCS | -0.601 (-1.77) | 0.413 (1.89) | 0.719 (1.54) | -- | -- |
| BF | 0.422 (2.45) | 0.214 (1.89) | 0.488 (2.34) | 0.219 (1.95) | 0.204 (1.68) |
| NBF | 0.313 (1.57) | 0.428 (3.13) | 0.288 (1.64) | -- | -0.196 (-1.35) |
| NW | 0.428 (5.44) | 0.228 (3.98) | 0.309 (2.85) | 0.228 (1.99) | 0.372 (4.25) |
| RL | -0.017 (-1.78) | -0.029 (-1.65) | -0.013 (-2.43) | -0.037 (-1.79) | -0.216 (-0.79) |
| RS | -0.020 (-1.38) | -0.145 (-1.67) | -0.077 (-1.76) | -0.682 (-1.35) | 0.711 (1.02) |
| CS | -- | 0.095 (2.48) | 0.088 (3.14) | 0.064 (1.09) | -0.203 (-2.63) |
| WPI | -- | -- | -- | -- | 0.123 (5.13) |
| Constant | -3028 (-1.85) | 2615 (2.97) | 719 (2.63) | 788 (1.04) | 1222 (3.01) |
| R ² | 0.94 | 0.93 | 0.89 | 0.93 | 0.98 |
| F statistic | 16.39 | 21.07 | 13.35 | 12.61 | 27.15 |
| D.W. Statistic | 1.88 | 1.95 | 1.97 | 1.89 | 2.01 |

R² is the unadjusted multiple correlation coefficient

effective compared to the fiscal policy incentives applied and which constituted the most substantial factor affecting self-financing. As far as interest rates are concerned, it was found out that what actually "counted" for investment activity was the total availability of funds independently of their maturity characteristics.

The final conclusion is that the unrealistic rate policy (negative real rates, lack of any substantial differentiation in the financial cost of short and long term business borrowing) caused severe distortions to the demand for loans, while at the same time, facilitating the building of business balance sheets with considerable maturity mismatch. Furthermore, it encouraged excessive stock piling, the leakage of funds to non-business activities and the overindebtedness of industries.

In 1987, the greek monetary authorities acting under the pressure of the EEC dynamics for the establishment of a single european market and a level playing field for banks, started the gradual deregulation of the banking system and the liberalization of the foreign currency transactions. This movement gained momentum from the beginning of the 1990's leading to the complete dismantling of the whole complex of the qualitative and quantitative direct credit controls in force and their substitution by the indirect controls imposed by solvency ratio and other related banking directives.

It is self evident that within the framework of the European single financial market, there can be no room left for monetary and credit policy to pursue independent national developmental goals. This task has been

exclusively assigned to fiscal policy acting in line within the limits set by the various national Community Support Frameworks and programs.


Nevertheless, the interest rates on government securities are still centrally determined, while the bigger and state controlled banking institutions are overburden with huge amounts of government debt, reflecting the outcome of their contribution to the finance of the excessive public sector borrowing requirements.

This situation is held, inter alia, responsible for strong “crowding out effects” in the credit markets, for keeping drachma real interest rates at high levels, and for diverting business loan demand to the foreign currency markets, where interest rates are considerably lower thanks to the strong drachma policy pursued by monetary authorities. These trends, apart from bringing about severe distortions in greek banks’ credit policy, encourage firms to be exposed to significant currency risks, or undermine efforts of drachma financed firms to gain a competitive edge in greek as well in european markets.

It is self evident that only by succeeding in reducing public sector deficits can Greece expect to secure conditions leading to the efficient functioning of the money and credit markets, which is a sine qua non for greek banks to be in a position to pursue their own credit policy and for entrepreneurs to choose the most efficient combinations available for their projects.

VI. Suggestions for Future Research

Despite the liberalization of the credit system after the year 1987, there is a slow response of Greek credit institutions to new conditions and opportunities. Further research should determine whether their sluggishness to adapt is due to, either : (a) the oligopolistic structure of the commercial banking system, or (b) the fact that the complex system of credit rules and regulations, imposed on the Greek credit system since the 1950’s, virtually stifled any initiative to innovate and modernize.

If the latter assumption proves to be true, it becomes evident that further measures, which will be taken in the future by the authorities aiming at increasing competition among commercial banks, have to be of a long - term and more persisting character in order to be able to produce sufficient favorable effects on the Greek economy. 

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