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PROFITABILITY AND PRODUCTIVITY IN THE GREEK CONSTRUCTION INDUSTRY

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Abstract: This report examines a method to evaluate the profitability and productivity of construction companies. A review of the European and Greek Construction Sector is made, followed by an industry analysis that is based on the application of standard financial and statistical methods and techniques aiming to identify the correlation between the change in profitability and the changes in the financial accounts and ratios of the companies. The major factors affecting profitability and productivity are identified resulting in the conclusion that the Greek construction industry exhibits certain unique characteristics - as well as impressively higher profitability- as compared to other sectors of the economy.

Keywords: Profitability, productivity, economic management.

1. INTRODUCTION

Europe is at the early stages of a period of great social, political and economic change, as a result of European integration, the enlargement of the Community, changes in the emerging democracies of eastern and central Europe, and also through wider changes in world trade. This has a direct impact on the construction sector, through:

- new infrastructure and building needs, and changing regional patterns of investment
- increased levels of trade and strength of competition, in construction work, products and services
- changes in the regulatory framework in which the industry operates: product approvals, registration, procurement systems, liability and insurance

There are also other changes affecting the industry at the same time:

- applications of new technology, creating needs for new skills and competencies
- changes in the construction process requiring new roles and new management procedures
- demographic and labour market changes, including immigration, affecting recruitment and the structure of the labour force
- environmental pressures

2. THE SECTOR'S PROBLEMS AND PRIORITY ISSUES

There are, however, enormously important issues for the long-term welfare of society and the growth and performance of European economies. These can be categorised into demand issues and supply issues:

2.1 Demand

The share of construction in the gross domestic product (GDP) of the European Community is too low. It has been in long-term decline. There is a crisis of demand caused by financing problems and declining public investment. The current recession makes the problem acute. This has a serious impact on Europe's economic growth, because construction comprises over half of gross fixed investment, and also on the competitiveness of other industries, and on employment. Construction output should be raised from its 1992 level of 10%/ of GDP to its previous level of 12%, with a long-term target of 14 to 15%.

2.2 Supply

The quality and value-for-money of construction in most countries can be improved. Clients are often dissatisfied, and this directly affects the demand for construction. There are also large potential savings in cost and time, which would enable a larger real contribution to be made with the resources available. Construction quaiity and value-for-money should be raised through training, innovation, standards, better procurement, guarantees and control.

2.3. Construction and Change

There has been fear in some countries that there might be a long-term, or a once-and-for-all drop in construction demand as population stabilises or declines, and as major infrastructure and housing needs are satisfied. However, social and economic changes will generate increasing construction needs and the problem will be to satisfy these needs. The share of GDP for construction should increase, but this will be difficult to achieve, because it implies increasing macro-economic savings rates, at the same time that public expenditure is constrained by tax and public deficit restrictions and more expenditure is needed to meet the needs of an ageing population and long-term structural unemployment.

There has been a long cycle in European construction activity, with a peak in the mid-1970s, then a gradual decline until the mid-1980s, and a short boom up to a new peak in 1990/1. If nothing is done to promote private demand, to halt the decline in public expenditure, and to provide the necessary funds for infrastructure, there may be a new decline, and then construction will not be able to provide the new infrastructure and housing that is needed.

One of the sector's greatest concerns is the volatility of construction demand. This is of particular concern at present when most countries are in recession after a very rapid construction boom. The volatility is most apparent in prices, since output is smoothed by the effect of lengthening and shortening planning and construction periods. Profitability is therefore very volatile and this severely inhibits long-term planning and investment in training, research and capital equipment. It is essential, therefore, that any measures to increase construction output should not be implemented merely to respond to the short-term recession, which might begin a damaging stop-go cycle of over-reaction followed by new restraints, but should be part of a long-term growth and employment strategy to raise construction levels gradually to a new steady state.

2.4. Competitiveness and Industry Performance

In one sense the competitiveness of the European construction sector, compared to that of other countries, is not seen as a real problem. The EC industries on the whole are as good as those anywhere in the world, and in many ways much better. Europe has a very diverse and attractive built environment, although with many severe needs for urban renewal, infrastructure and housing improvement. It has many of the world's best designers and most beautiful cities.

The efficiency and responsiveness of the construction sector depends on its structure, with a very large number of very small enterprises; 97% of the 1.8 million firms have less than 20 employees and about a quarter are self-employed persons. This reflects the large number of small contracts, the extensive use of subcontracting, the wide variety of technologies, specialisms and clients, and the very local nature of most of the business. Half of employment in contructors is in firms of less than 20 employees; 90% in firms of less than 500. So SMEs will be the main source of new employment and need support.

On the supply side, the main concerns of firms in the sector can be summarised as:

- recruitment and skills problems, partly resulting from poor on-site working conditions and a poor industry image
- poor profitability, partly a result of market characteristics which lead to cut-throat competition, resulting in inadequate investment in training and research
- increasing costs due to stricter environmental, health and safety, and trade legislation

An analysis of available data on project costs, along with materials prices and wage costs, seems to indicate that differences in construction costs between EC states are largely due to differences in the general price level. This is despite large differences in real wage rates between Member States. It appears that the low-wage countries (which include Portugal, Greece and the UK) also have low productivity.

There are very wide differences in the prices of construction and products between countries, but there is no clear pattern of high- and low-cost countries. Differences are due to local market conditions, and the fact that there is very little trade in construction products because of the low value-to-weight ratio of most const-

truction products, and to very different standards and specifications and barriers due to differing testing and product certification requirements.

2.5. The Role of Government

The State has a role as regulator and as major client for the construction industry. Both roles should be used to improve quality and value-for-money in construction and the quality of the built environment. The State is also often a major supplier of in-house services, and funds research, training and support services. Throughout Europe, as a result of privatisation, government's direct role as a customer is declining in volume but not in importance.

It is a conclusion of this study, overwhelmingly supported by the majority of people consulted in the sector, that the sector must take action itself to face the challenges of the future, with a minimum of new intervention or new legislation; however, government has an essential role in providing a stable and certain regulatory, planning and market environment; providing support services in training, research, information; and as a responsible major consumer.

2.6. Regulation

An industry which provides 10 to 15% or more of GDP, and in which commercial relationships between private clients and contractors affect the every-day lives of all citizens, must receive a large share of government attention. It could well be argued that governments in Europe pay too little attention to the well-being of the construction industry, compared to the attention they give to other sectors. This report has concluded that more support is needed for training and for research and innovation, which because of the structure of the industry and its markets are not adequately provided by firms acting alone. On the other hand, intervention usually distorts markets, creates opportunities for corruption, and creates bureaucratic inefficiencies and additional costs, which must be avoided. Government has an essential role in the regulation of the industry and its markets which should in general be maintained, but streamlined and simplified where possible.

Regulation is required to protect the interests of consumers and future generations. This means efficient land use planning and construction control, and a clear regime of liability legislation, with an efficient system of claims litigation. It also means ensuring vigorous and well-trained professions of town planners, architects, engineers and building controllers. Since most clients select their contractors and consultants without the previous experience of working with them, regulation is needed of the training, qualifications, capacity and record of those practicing in the industry.

Whereas governments can regulate to control prices and the quality of service in monopolistic industries where competition is inadequate, they are not able to regulate to control excessive competition. They can, however, ensure that systems exist to make sure that those who practice in the industry have proper qualifications and their capabilities are registered, to prevent excessive competition from debasing quality.

3. ECONOMIC MANAGEMENT

It is generally considered that government management of the economy includes maintaining stable and adequate levels of employment, reducing the volatility of business cycles, and optimising the rate of growth and hence the level of savings and investment. In a market economy, it is not the business of government to plan and control the level of activity of individual market sectors. Construction, however, is intimately linked to the level of investment and growth of the economy. Construction output is generally about half the total gross fixed capital formation: increased investment requires buildings and infrastructure, and conversely increased investment in infrastructure increases the competitiveness of industrial and commercial activities, and generates new opportunities for profitable investment. It is therefore right for government to be concerned about the level of construction activity, over and above the concern for housing and the social infrastructure.

3.1 Market stability

It is frequently argued by the industry that government should act to even out the fluctuations in construction activity by managing the programme of public expenditure on construction. Stability is important because the volatility of local construction markets has a damaging effect on investments in training and technology. In practice, however, government intervention for short-term sector demand management will almost certainly be counter-productive because the timing is likely to be wrong, and will be economically inefficient because the wrong projects are promoted, and hence will depress growth. Investment should respond to demand and go where the return or the benefit/cost ratio is highest.

It is strongly in the interests of the sector to keep public construction spending steady, and avoid stop-go cycles. Cutting infrastructure and building programmes to balance budgets when social security spending is high in a recession, will create more unemployment. The public purse benefits in the long run by allowing contracts when prices are weak, not during a boom.

What is needed is for governments and public authorities to set out long-term infrastructure investment plans and public building programmes based on a realistic target level of total construction output in relation to GDP, and the share of public infrastructure spending within that, keeping regional development objectives in mind, and then to stick to the plans. This would enable private developers and industrial investors to plan accordingly and reduce volatility.

In most countries governments also intervene in housing and building markets, by controlling mortgage interest rates, providing interest rate subsidies, tax allowances on housing costs or interest payments, grants to housing associations, rent controls, etc. Government also directly affects building levels by its policy on land use and the release of land for development, and some governments have development taxes or other tools. In all of these interventions the government should try to keep construction activity at a steady, achievable long-term level.

The economic environment in late 1993 and early 1994 is one of recession and growing unemployment throughout Europe, so that growth, competitiveness and employment are the most important political issues. Construction output has fallen to 10% of GDP. The financing of structural funds and other EC instruments can help governments raise national construction output nearer to 1989 levels to give an average share of at least 12% of GDP, not just as a short-term measure, but to maintain construction at these steady levels or gradually increase in the long-term, to create steady growth and employment.

4. THE GREEK CONSTRUCTION SECTOR

The analysis of the Greek construction industry covers 211 construction companies and 135 design and consultancy firms. Although construction companies have some similarities with traditional industrial companies, both construction companies and design and consultancy firms seem to have the same characteristics that most service firms have. The analysis was based on the application of standard financial analysis with the use of certain financial ratios chosen in order to describe the special financial characteristics of the construction sector.

4.1. Profitability

The indices used for the estimation of the companies profitability were the ratios net profits / stockholders equity and net profits / sales. The mean values of both ratios for 1993 were impressively higher than the respective ratios for traditional industry in Greece in the same year; construction companies had a mean value for net profits / stockholders equity equal to 0.354 and net profits / sales equal to 0.171; design and consultancy firms achieved a 0.492 and a 0.306 value respectively. Compared to the mean values of traditional industry that do not exceed 0.10 and 0.05 respectively, the profitability patterns of companies in the construction sector match those of service sector companies such as advertising and insurance firms.

One should however note that the insecurity of the sector prevents newcomers from entering the sector unless the potential profits are high enough. In the same manner, existing firms stay in the market, tempted by the high, though insecure, profit margins.

4.2. Liquidity

Investment in the sector, especially in view of the projects financed by the EU, is almost obligatory in order for the firms to survive the competition. As a result, a wave of investing in equipment and machinery hit the whole sector and most companies accumulated large amounts of debts. Due to the high interest rates of the last decade, the cost of the loans was a major factor affecting company profitability.

4.3. Company size

Although the 30 largest construction companies and the 20 largest design and consultancy firms have cornered the market as regards the number of projects they construct or design, their profitability is well below average. It is the small firms and the specialised in particular that present the highest profitability. Most companies achieving high profitability are, regardless of size, specialized in a particular field. For example two out of three large construction companies (with stockholders equity larger than 400 million drchs.) that have a profitability ratio (net profits / stockholders equity) greater than 40% are involved mainly in the market segment of foundations and specialised geotechnical projects. Similarly, all four large design and consultancy firms (with stockholders equity larger than 55 million drchs.) that achieved a profitability ratio greater than 80% are involved either in environmental or geotechnical studies. Of the 44 construction companies with a net profits / stockholders equity ratio greater than 40% over half are specialised in a particular field; the same is true for most of the 66 design and consultancy firms with a greater than 80% ratio.

Table 1 : Size and profitability correlation (construction companies)

	prof.ratio <20%	20%<prof.ratio<40%	prof. ratio>40%
St. equity < 200 million drchs.	19 companies	23 companies	26 companies
200 < St.eq< 400	33 companies	37 companies	15 companies
St. equity> 400 million drchs.	36 companies	22 companies	3 companies

Table 2 : Size and profitability correlation (design and consultancy firms)

	prof.ratio < 30%	30%<prof.ratio<80%	prof. ratio>80%
St. equity < 15 million drchs.	9 companies	11 companies	28 companies
15 < St.eq< 55	11 companies	17 companies	24 companies
St. equity> 55 million drchs.	24 companies	17 companies	4 companies

5. FACTORS AFFECTING PROFITABILITY

Apart from the special capabilities and strengths of each company, profitability is affected by the companys financial situation. Given that the market requires constant investment and a company's survival depends greatly on its liquidity, this

market analysis conducted a research on the degree to which these factors affect the companies' profitability.

The "net profits / stockholders' equity" ratio was correlated with three other financial ratios:

- fixed assets / total assets, as an indicator of a firm's investment policy
- stockholders' equity / total assets, as an indicator of a firm's borrowing policy
- liquid assets / accounts payable, as an indicator of a firm's liquidity

The annual change of the values for the four ratios of 30 construction companies were calculated for the years from 1980 to 1993 and the multiple regression method was used in order to estimate the degree to which the changes in the three independent factors affect the change in profitability (dependent).

According to the results of this application, liquidity seems to be the main factor that affects profitability. Partly due to the high interest rates in Greece, a 10% change in the "liquid assets / accounts payable" ratio can invoke a 5% change in the net profits / stockholders equity ratio, all others being equal (Beta value = 0.5). This can be explained by the structure of the market in Greece that, in relation to the debt burden, does not allow extensive borrowing or excessive payment delays.

The fixed "assets / total assets" ratio is also of great importance as a 10% change can invoke a 3.5% change in profitability. This means that heavy investment, apart from being driven by tough competition, can offer profits, at least in this period, when a great number of projects were available.

Finally, a 10% change in the "liquid assets / accounts payable" ratio results in a 3% change in profitability. This is due to the combination of high profitability and high interest rates, a combination that makes borrowing unfavorable and investing one's own money in the company more than compensating.

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