THE CONSTRUCTION INDUSTRY IN A SMALL OPEN ECONOMY: THE CASE OF BARBADOS

by

Denny Lewis-Bynoe
Research Fellow
ISER, UWI, Cave Hill Campus

&

Adrian Carter
Research Officer
Research Department
Central Bank of Barbados

Presented at the Annual Review Seminar, Research Department,
Central Bank of Barbados
July 27 - 30, 1999

Abstract

The construction industry is very unique and critical industry of the economy of Barbados, whose contribution to national development can not be over emphasised. This paper examines the role which the industry has played in the economy, with the aim of offering a better insight on the issues which contributes to its performance.

The Construction Industry In a Small Open Economy: The Case Of Barbados

Introduction

The construction industry is an essential component of the economy of Barbados. It is responsible for building the facilities and supportive infrastructure necessary for the nation to produce wealth and provide for and deliver services to its citizens. Over the last two decades the industry has played a significant role in diversifying the Barbados economy by satisfying some of the basic objectives of development, including output generation, employment creation and income redistribution. In addition the industry serve to improve the quality of life, by providing the infrastructure necessary for new housing and the provision of social services such as education and health services which are essential for community life.

On occasions, however, the resources required to sustain the growth of the industry or capabilities needed to transfer the available resources into construction facilities are not available at an acceptable level. In these cases balances of payments difficulties and or inflationary tendencies may emerge in the economy. Yet the industry's contribution to the sustained development of the economy is often neglected or, at best taken for granted. This paper thus examines, the role which the construction industry has played in the development of the economy of Barbados over the last two decades, with the aim of offering a better perspective on the industry and the factors which contributes to its viability and growth. Thus contributing to our understanding of the mechanisms needed to ensure the sustainable development of the construction industry, in the context of a small open economy.

The paper is organized into four main sections. The first section provides some insight into the nature of the construction industry, its peculiarities as well as its principal players are highlighted. Section 2 offers a historical analysis of the industry's contribution to the performance of the economy. This includes a discussion of the factors affecting the demand for the industry's product. Section 3 looks at the future of the industry and its growth prospects. The paper concludes with a brief look at some of the potential challenges the industry is expected to face in the future.

1. The Nature of the Industry

The construction industry can be described as that sector of the economy which through planning, designed, construction, maintenance and repair transforms various resources into constructed facilities (Carter and Whitehall, 1999). The characteristics of the industry's products, which includes its custom built nature, immobility and high initial expense, sets the construction industry apart from many other industries in the economy.

Unlike other industries in the economy, where production activities are initiated on the basis of anticipated demand, construction activities are driven by actual demand. The customer determines his need for the facility and procures the necessary services. Generally, the industry's products are less standardized than the products of many other industries, with each product being quite heterogeneous, with a separate design, requiring its own particular plans and specifications. Also, its economic life is expected to be long compared to other durable consumer and capital goods, thus requiring a high proportion of current construction output

to be devoted to maintenance and repair work, necessary to keep existing buildings and construction works in a usable state.

Another unique feature to the industry is its procedure for financing production. Production is financed largely by the customer, rather than by the manufacturer, by periodic payments to the producer during production. Moreover the source of the customer's financing is often loans secured by the constructed facility itself. The immobility of the constructed facility makes the stability of local demand of particular importance, unlike other sectors where the product is mobile. Furthermore stockpiling of constructed facilities in inventories is not possible and thus no buffer exists between production and demand. In addition to the specialize character of each product, the project oriented nature of production, its seasonalility, and susceptibility to economic fluctuations combines to make the demand for construction products inherently unstable. Consequently, the construction labour force is generally a floating rather than a permanent one.

The Industry's Players

The players in the industry can be divided into three groups namely the client, the professional and the contractor. These players are each from an independent organization and are gathered together on a project by project basis. Their selection is usually base on price and or some other qualification and is generally brought into the project only when needed. This arrangement, is quite different from that in other industries where the designer and producer collaborate to obtain a finish product and the client enters at the end.

The owner, who may be an individual, a corporation, government body or some other private or public organization, combines with investors and developers to form the client group which initiates and finances the project. Their role throughout the construction process involves primarily the assessment and approval of the activities of the other players. The client initiates the entire operation and commissions the contractor to carry out the work and provides most of the capital necessary for the completion of the project. In addition, financial institutions and government bodies also plays an important role in establishing the overall business environment in which the sector operates. They are largely responsible for determining the ease with which financing is obtained and the project approval granted. Furthermore, in the context of a small open economy, where a significant portion of its material inputs into the construction process are imported, government can influence the price and availability of materials through legislation.

The architects, draftsmen, engineers and quantity surveyors form the professional group of the industry. They major roles includes ascertaining the needs and desires of the client, developing a design to the client's approval, preparing instructions for the contractor, estimating the materials needed and cost of the project. Most small-scale projects utilise the services of a draftsman, rather than an architect. However, the work of the professionals are still evident in all construction products. This group is sometimes, also responsible for overseeing the project and selecting or aiding in the selection of contractors for the project on the behalf of the client.

The contracting group is responsible for the assembly on site of the various components required to complete the project. This group consists of general contractors, specialty contractors better known as sub-contractors, and construction workers. These players are responsible for planning, coordinating and supervising the entire production process as well as to ensure that the completed facility adheres to the projected plans and specifications. In most construction processes the main contractor handles only the building operations connected with the superstructure of the building. The more specialized activities connected with finishes are usually delegated to separate sub-contractors.

The amount of work subcontracted can vary. In some instances the contractor acts as coordinator of the various sub-contractors, who are responsible for all the work. In other cases no main contractor is employed, separate contracts are made with each specialty group, leaving the responsibility of coordinating and supervising the work with the client or professional sector.

The Construction Process

A clearer perspective on the complex relationship between the various participants in the industry can be obtained from a brief view of the phases in the construction process. These processes includes, developing the concept, securing financing, developing the design, obtaining regulatory approval, building the project, maintenance of the asset once completed and demolishing the asset at the end of its life.

In the opening stage of the project the clients assesses its need for the facility, its user requirements and determines they budgetary constraints. These considerations are necessary for the client to formulate a brief to be presented to the professional sector which on the basis of that information would determine the design, technology and contractor needed to complete the project. On the basis of the information provided by the client, the professional sector develops a preliminary design and cost estimates in addition to preparing supporting documentation needed to market the proposal to potential financiers and government authorities involve in the approval process.

Once financing is obtained and construction approval granted the task of constructing the project is handed over to the contracting sector. The procedure for awarding the contract is usually based on either an open or closed tender system. The open tender allows all contracting firms with an interest in the project an opportunity to submit their tender price, whereas in the closed system only selected firms are permits to compete for the contract. The contracting firm under both systems with the lowest realistic tender price is usually awarded the contract.

The contractors generally follow the instructions as specified by the professional sector to complete the project. Throughout this phase the activities of the contractors are followed and supervised by the client or his professional representative. To safeguard the interest of the client against defects, payment for a certain portion of the work done is delayed until the completion of the entire project. Once the work have been

completed and meets the approval of the client it is surrendered to the to the client, who have the responsibility for the operation of the asset and its maintenance.

As the construction product age and styles change, the client often find it necessary to undertake major renovations of the property to improve its performance and appearance. This involves the repair and replacement of deteriorated components and the upgrade of systems that have become obsolete. At some point, however, it is not cost effective to renovate the product and hence a decision is made to demolish the asset.

2. The Industry in the National Economy

The construction process as highlighted above operates in the context of the local economy. Its relationship with the economy is a somewhat reciprocal one in which the economy contributes to the survival of the industry which in turn impacts on the economy's performance.

The industry has been a critical component of the economic infrastructure of Barbados, providing a catalytic force which drives the other sectors of the economy, through its backward and froward linkages. Its dependence upon other industries in the economy for its inputs into the construction process, have served as an important stimuli for activity in these industries. The manufacturing industry have benefited substantially form expansions in construction activity, through the industry's demand for cement, quarry products, non-metallic mineral products and other locally produced building material inputs. Also benefiting is the wholesale and retail industry as it acts in the capacity of distributor of the locally produced and imported building materials inputs and the utilities industry (Figure 1).

The growth in the sector's output overtime, therefore reflects both the economic health of the country and its future growth potential, as given by the stock of physical infrastructure which the sector provides. Between 1975-1996, the Barbadian economy experienced real economic growth of on average 3.5% and according to current estimates, the construction sector contribution to this growth averaged 7%. During this period, the performance of the sector has been highly correlated to that of the overall economy (Figure 2).

The movements in construction sector's GDP over time highlights some interesting developments. At the beginning of the review period, economic activity in the sector fell, due to adverse external demand conditions of Barbados' major trading partners. In 1979, however, the industry recovered, recording real economic growth of 7.9%. Public sector construction investment activities was largely responsible for this growth over the review period (Figure 3).

Government's extensive capital works programme did, however, create bottle necks within the industry, resulting in a shortage in both skilled and unskilled labour. In the early 1980s, an international recession adversely affected the domestic economy and the demand for construction services, highlighting the

economy's vulnerability to external shocks and stimuli. By 1984, the recession had ended, as a pickup in global economic activity was transmitted to the domestic economy generating real sectoral growth in the construction sector, of on average 5%. Between 1985/86 and 1989, the declining cost of construction and increased access to credit, facilitated the growth of private construction. Since the late 1970s private building activity has accounted for an increasing proportion of total building activity. This growing private sector investment and the relatively smaller contribution by the public sector is suggestive of the economic advancement of the country from its primary development stage. At the time the buoyance of the economy also allowed government to expand its capital works programme.

The pattern of global recessionary induced declines and recoveries in output continued into the 1990s. The country entered a recessionary period in the early 1990s, spurred by an international recession at a time of fiscal and monetary imbalance in the domestic economy. As expected the demand for construction activity fell significantly, by 13.0% on average. Both private and public sector construction activity declined (Figure 3). During this period, the country undertook a programme of structural adjustment during which there was a complete halt of government construction programmes. In addition, the contractionary monetary policy adopted by the government at the time resulted in a significant reduction in private sector activity.

By 1994 the economy had returned to a growth path. There were a number of public and private sector construction initiatives undertaken following the recession. The large influx of tourists allowed many hotels to refurbish their property and new roads and public buildings to be constructed. The main indicators of construction activity, cement, imports of construction materials, and quarrying output showed significant increases during this period. These demand pressure would again create production bottlenecks, in the industry, as labour shortages arises.

2.1 Demand for Construction Activity

The demand for construction activity in the economy of Barbados have been driven by a number of factors namely, residential construction, institutional, commercial and industrial construction as well as engineering construction. The demand for construction activity is however, not to be confused with the demand for buildings. The former arises from the actions of private individuals and organizations as well as government bodies, motivated by expected benefits from the new or renovated structure. Whereas, the latter is generally satisfied by the existing stock of buildings which have been accumulated from past construction activity.

2.1.1 Residential Construction

The market for residential construction includes dwellings ranging from single-family homes to large apartment buildings. The demand for this type of construction activity increased at an average rate of 2% per annum between 1980 - 1997[1]. Demand was generally high during the 1980s driven primarily by an increase in workers disposable income, as indicated by public sector 30% wage bill settlement and reduced

[1] Applications submitted to Town and Country Planning for residential dwellings are use as an indicator of residential construction demand.

taxation on personal income leading up to the 1981 general elections as well as wage increases averaging 7% per annum between 1982 and 1984. However, job losses and salary cuts that accompanied the economy's recession of the early 1990s significantly effected the performance of this market. The reduction in personal disposable incomes that ensued resulted in an average fall of 10.2% in demand for the 1990 to 1993 period. The years succeeding the recession saw very little improvements in the demand for residential construction activity. This ensued, as the disposable incomes of private individuals remained constant following the protocol between government and the private sector to freeze wages.

Since 1980, approximately 27,357 dwellings were added to the local housing stock, which stood at around 84,719 in 1997[2]. In regards to the type of structures completed, there have been a shift away from wooden dwellings which constituted only 29.2% of the addition to the housing stock, to stone structures which accounted for 64.4%. New residential mortgage loans by local financial institutions during the 1980-1997 period amounted to $650.6 million. This figure was pronounced between 1985 and 1990 when $354.5 million was disbursed to finance a number of the 6,072 new homes started (Table 1).

2.1.2 Institutional, Commercial & Industrial Construction

The institutional, commercial and industrial construction market encompasses all building activity that is not residential, such as medical and educational facilities, offices, stores, hotels, plants and warehouses. A considerable amount of this type of construction activity have been demanded locally, by both the private and public sector over the last two decades. Private sector demand have been mainly in the area of hotel accommodations while that of the public sector have been in the areas of health and educational facilities.

Particularly in the late 1980s early 1990s, government's demand for construction activities for infrastructural purposes droved the demand in this market. Construction work was undertaken to provide extensions to the Queen Elizabeth Hospital and a number of polyclinics around the island during this period. Also, major investment were made in the refurbishment and construction of a number of primary and secondary schools around the island in addition to the construction of the Sherbourne Conference Centre. Government's demand for this type of activity slowed considerable as the economic entered some economic turmoil early in 1990s.

Since the recession of the 1990s, the demand for tourism related construction activity have been one of the main impetus for the growth of the construction industry. During this period a number of major projects came on stream, such as the Royal Westmoreland Golf Resort, Port St. Charles Marina as well as a number of luxury villas on the west coast of the island, which required a significant amount of this type of construction activity. The majority of demand in this market, however, took the form of maintenance and renovations to existing properties as hoteliers continued to maintain and refurbish plants in an effort to remain competitive.

[2]Electrical inspections of new dwelling by Government Electrical Department is used as an indicator of increases to the housing stock.

2.1.3 *Engineering Construction*

All non-building construction projects are included in this market, such as roads, sewers and water, bridges and airport facilities. The demand for this activity was influence primarily by government spending on public infrastructure which amounts to approximately $575.5 million on roads and airport development between 1980 and 1997. Demand was particularly large during the 1980s as government embarked on a number of minor road works and constructed the Adams Barrow Cummins Highway. Demand for this type of activity declined by an average rate of 18.1% per annum during the 1990-1993 period as government halted most of its major projects. After this period, demand once again was high as government resumed its road works program, commenced construction of the Highway 2A project and in 1996, the South Coast Sewage Project.

2.2 *Sectoral Employment*

A significant number of Barbadians are employed in the construction industry, because of its labour intensive nature, approximately 8.0% of the total workforce (Figure 4). In general, sectoral employment has been relatively stable which suggest a steady demand for construction services, even in periods of economic downturn. The dynamics of the industry meant that it was well positioned to deal with the changing economic circumstances, which accounts for the stability of its contribution to GDP and employment overtime. There is a prevalence of small establishments in the industry, approximately 61% of construction establishments can be characterised as small scale operations, employing less than 10 persons. The under twenty employees category accounted for 75%, this is in comparison with a 1970 figure of 15% On other hand, approximately 5% of the construction establishments currently operate with over 100 employees. The prevalence of these household type businesses with their practice of opening and closing as the economic climate changed would undoubtedly have contributed to the stability of the industry. Their small scale of operation and therefore overheads allow them the flexibility to stay profitable during good times, while shutting down and cutting losses during bad times.

2.3 *Productivity and Wages*

Overtime improved technology and increased mechanisation should have have allowed for increased productivity. This has however not been the case, according to figure 5, productivity in the industry actually fell, though marginally, over the review period. The ratio of output to employment for the sector rose sharply in the early 1980 and have steadily fluctuated. Surprisingly, the declines in productivity associated with the economic recessionary periods of 1981-1982 and 1990-1992 experienced by other sectors in the economy were not evident for construction[3]. In the recession of the early 1990s output per employee rose, and conversely during periods of economic upturn there were general declines in productivity. These developments may reflect the increasing use of unskilled labour as sustained increases in demand for construction services create shortages in the supply of skilled labour.

[3]This reflects a general tendency for the rate of growth of employment to lag behind that of output. The lag was found to be greater when the economy is coming out of a recession than when it is going in. Employment declines within a year after the onset of an economic downturn but it takes about two to three years to pickup following an economic upturn.

Over the last five years, productivity in the industry has fluctuated slightly below the average of the previous decade. This trend is only worrying if coupled with strong upward movement in wages. According to the wages index compiled by the Central Bank of Barbados, wages in the sector have been steadily increasing, though at an decreasing rate (Figure 6). Typically, increasing economic activity leads to a pickup in demand for construction services and the accompanying increase in the demand for labour pull wages up. As evident in figure 7 the converse is also true. In the recession of the early 80s, wages were unchanged, after previous years' increases of over 30% and fell by on average 8% in the 1990 recessionary period. Unfortunately, the index ends in 1994 so that there is no recent wages data. There is, however, no reason to expect that this historical pattern did not obtain for this period. It is highly, likely that wages in the sector have increased substantially in recent times, as a result of the scarcity premium attached to construction sector workers.

Under these circumstances declines in productivity translate into higher cost in the industry. The continued growth of the industry during periods of prolong and sustained economic upturns is facilitated by the increasing use of unskilled labour. The increasing ratio of unskilled and skilled labour reduces productivity and coupled with higher wages generate higher than are necessary cost in the industry. Naturally, these cost are transmitted to the wider economy. Any burden imposed on the economy by the inefficient use of its scarce resources are further compounded by the industry's heavy reliance on imported inputs and the resulting foreign exchange outflows.

2.4 The construction Sector and the Balance of Payments

In the context of the small open economy, like Barbados, the Balance of Payments position is critical. The construction sector as a non-traded sector, though critical to the overall development of the economy, puts a considerable strain on the foreign exchange resources of the country. This is less of a concern if the growth in construction is accompanied by stronger growth in traded sector activity. A problem arises when the growth in activity in the non-traded sectors outstrips traded sector activity, as has been the case for the last few years.

3. Growth Prospects for the Industry

The structural characteristics of the construction industry, which have enable it to survive the recessions of the early 1980s and 1990s will be essential for its future growth. Over the short to medium term the industry is envisage to continue to growth as much of the infrastructure and buildings require for the economy's continued growth still needs to be built. In addition the industry will also benefit from a need to maintain the existing stock of constructed facilities.

Investments by both the public and private sectors in the areas of economic infrastructural developments and hotel accommodations, are expected to provide a catalyst for the continued growth of the industry. The major economic infrastructure projects includes, the urban rehabilitation of the country's two major towns Bridgetown and Speightown as well as the St. Lawrence Gap. Also included is the expansion of the national air and sea ports. It is estimated that the cost of these investment project will be in excess of $381.7 million

over the next five years. The private sector is also expected to invest in excess of $94 million on the construction of the Pierhead development project[4].

The number of development planning applications which have been approved and are currently being processed by the local town planning department, suggests that significant amounts of construction activity will be demand for tourist related projects up to the year 2003. It is projected that over next five years, in excess of 3, 000 rooms will be constructed and refurbished, and the level of room stock will surpass 10,000 within the next ten years in the hotel accommodations sector.

4. Conclusion

A number of challenges exists, however, to the ability of the local construction industry to realize the level of activity anticipate over the short to medium term. The first relates to the scarcity of skilled labour to undertake the construction work. As the industry expands it will require an increase amount of skilled workmen to construct the facilities,. Given the limited amount of these skilled workers in the local economy a number of projects which might have been profitable under current market conditions might have to be delayed. Market conditions, during the waiting period may change so dramatically that the project becomes unprofitable, resulting in its abandonment

Secondly, the scarcity of skilled labour also presents the challenge of controlling costs within industry. The client is usually very eager to get his project to the stage at which it begins to yield economic benefits, so as to capitalize on the opportunities of the existing market conditions. To this end, in periods in which the demand for the skilled labour is in excess of its supply, firms will bid up wages in order to attract the skills they require to get their projects completed. It is estimate that the cost of labour have increase by 25% over the last two years due to this bidding process. In addition to a rise in the cost of labour, increase construction demand can put upward pressure on the cost of the material inputs into the construction process. In the local economy approximately 55% of the material inputs into the construction process is imported the remainder are locally produced (Carter and Whitehall, 1999). Barbados is regarded as a small open economy (Carter, 1997) and hence is unable to influence the price of its imports, but as the demand for the locally produced portion of the inputs increases the cost of those materials may rise especially if the supplier have some monopolistic power in the market. The resulting increase in the construction cost may have a distribution effect over the economy as clients also rise the cost of the goods and services which they produce in order to obtain a reasonable return on their investment.

Finally, the advent of globalization and trade liberalization will also presents a challenge to the local industry, as it results in a change in the business environment in which the industry presently operates. As the demand for construction activity increases and become more lucrative in the local economy, local firms will be faced with increase competition from larger and more efficient foreign firms attracted by potential profits

[4] For additional information surrounding these projects please see notes.

References

Braithwaite, Carlos, "The Construction Industry in the Economy of Barbados 1960 -1980", Central Bank of Barbados, *Economic Review*, September 1982, IX (3), pp. 10-29.

Carter, A., "Economic Size, Openness and Export Diversification: A Statistical Analysis" Central Bank of Barbados, *Economic Review*, December 1997, XXIV (3), pp. 15-22.

Carter, A., and Whitehall, P., "Estimating real Value Added In the Construction Sector of Barbados". Mimeo.

Cort - Corbin, Hazel, "Sources and Methods of Estimating National Income and Product Accounts for the OECS Member States", O.E.C.S. Economic Affairs Secretariat, June 1985.

Hill, T.P., "The Measurement of Real Product - A Theoretical and Empirical Analysis of the Growth Rates, for Different Industries and Countries", OECD Economic Study Series, February 1971.

Lewis, Denny, "A Quarterly Real GDP Series for Barbados, 1974-1995: A Sectoral Approach" Central Bank of Barbados, *Economic Review*, Vol. xxiv, No. 1, June 1997, pp.17- 56

Stone, Richard, "Quantity and Price Indexes in National Accounts" Organisation for European Economic Co-operation, Paris, November, 1956.

Appendix

Table 1. Construction Indicators

Period	Residential Construction Demand (% Growth)	Residential Starts	Residential Completions
1980-1997	2	15336	27357
1980-1985	7.4	3894	5077
1985-1990	3.8	6072	12783
1990-1993	-10.2	3493	7675
1993-1997	-2.5	3711	6743

Figure 2. Real GDP 1974 Prices

Percentage change

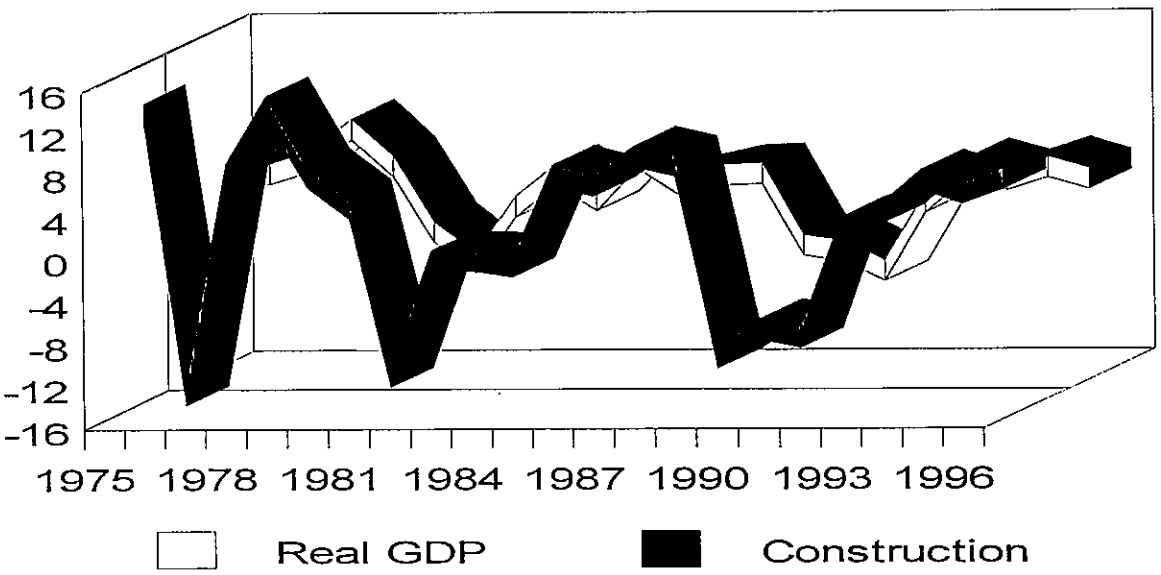


Figure 1. Real GDP of Selected Sectors

(BDS$ Million) 1975 - 1995

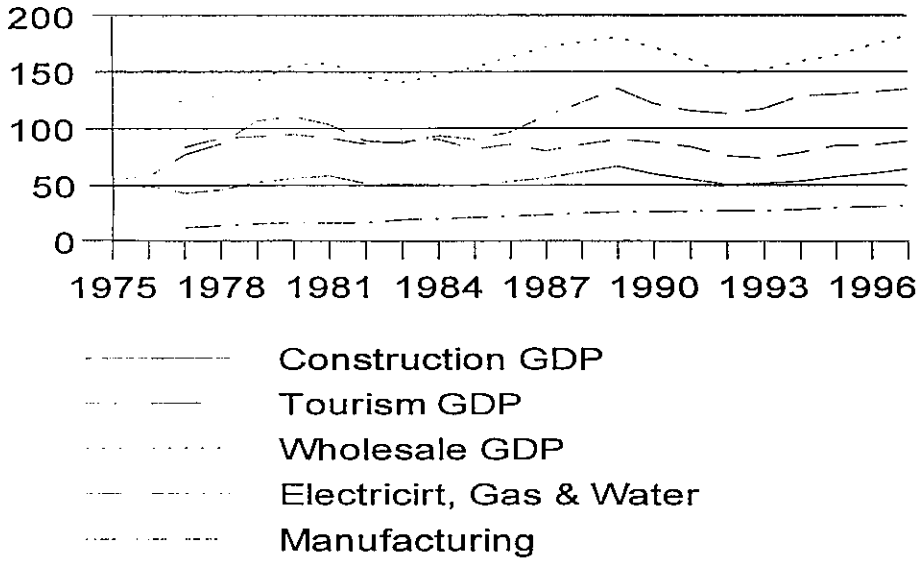


Figure 3. Building Activity(BDS$ Million)

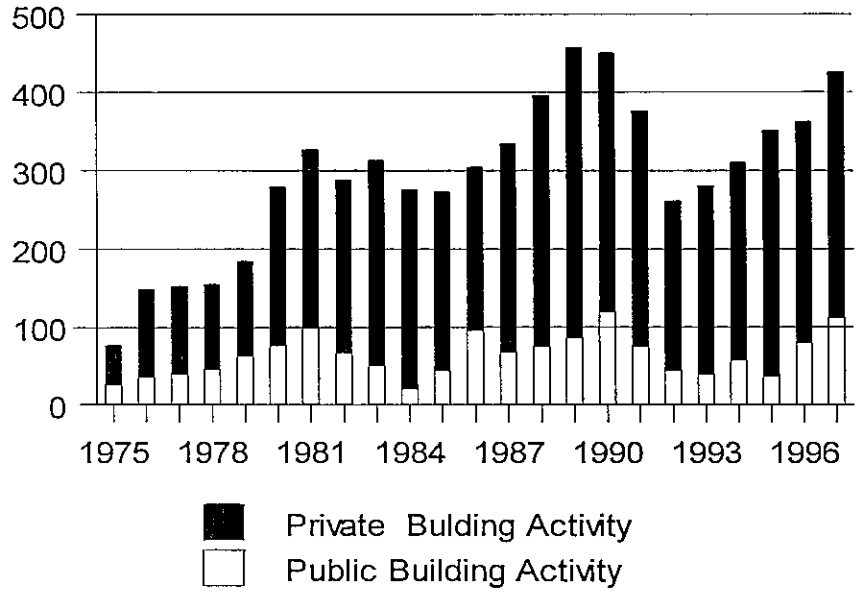


Figure 4. Construction Sector Employment

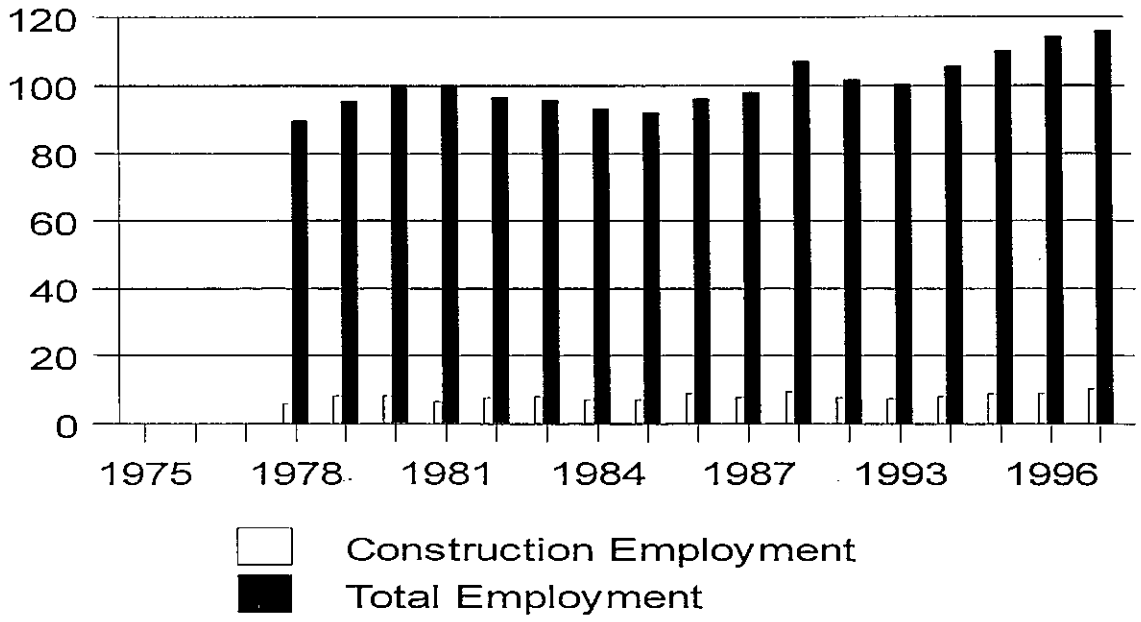


Figure 5. Output Per Employee($'000)

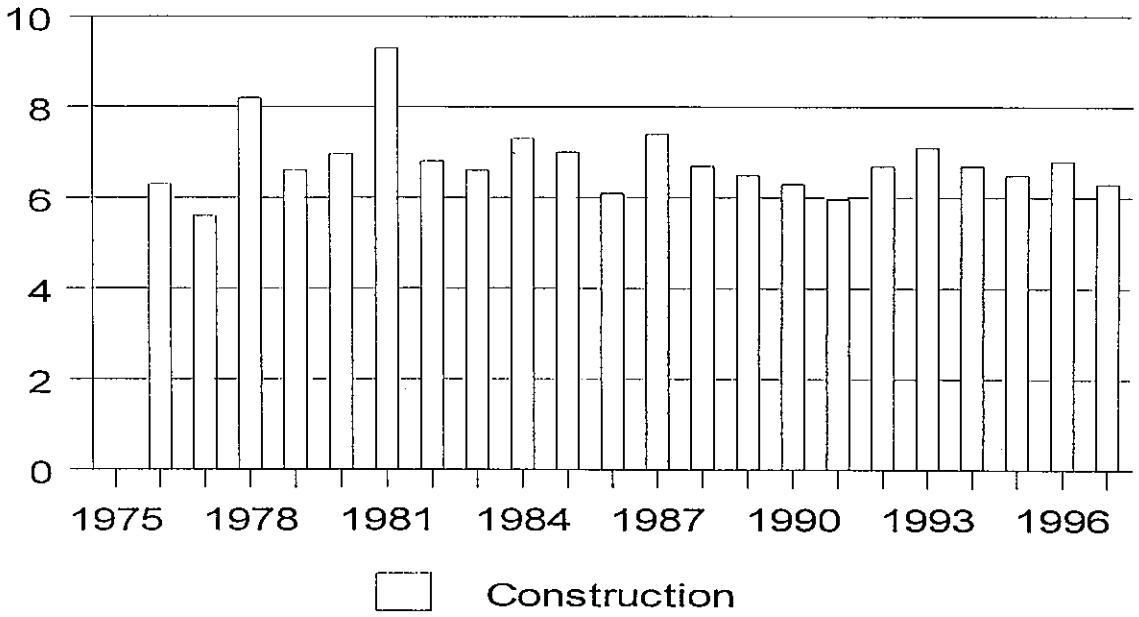
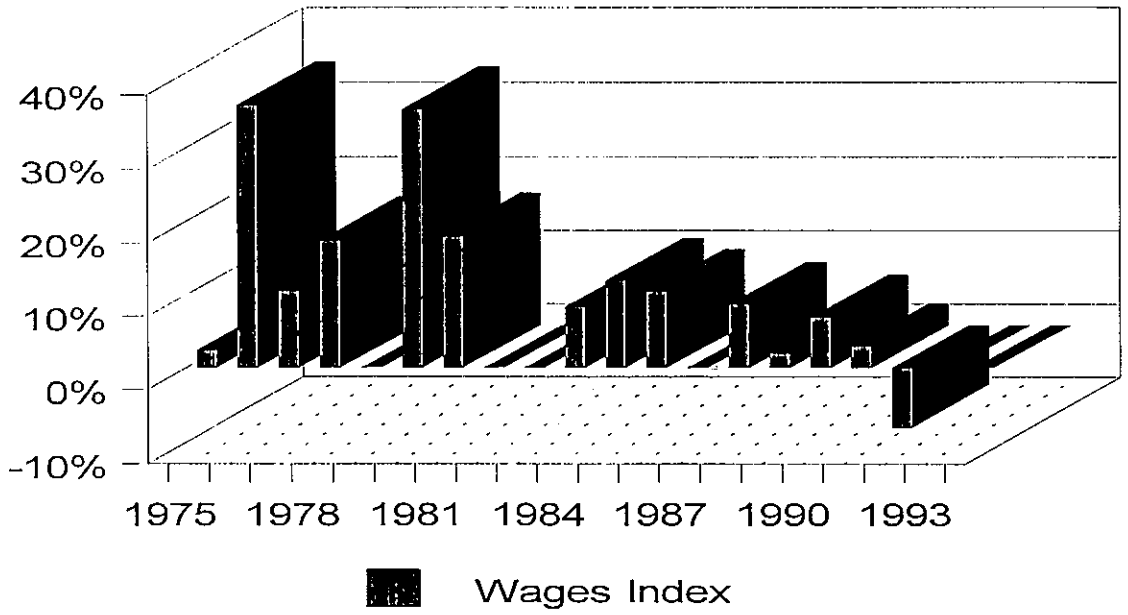
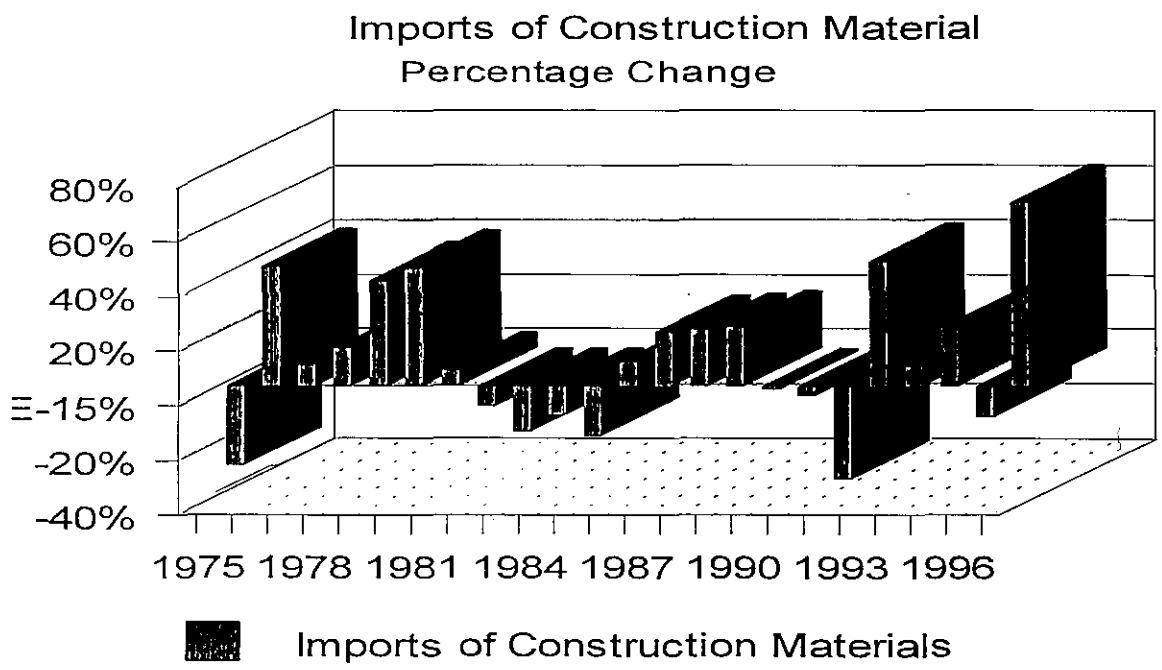


Figure 6. Wages Index % Change




Imports of Construction Material
Percentage Change
80%
60%
40%
20%
-15%
-20%
-40%
1975 1978 1981 1984 1987 1990 1993 1996
Imports of Construction Materials