Routledge
Taylor & Francis Group

Construction Management and Economics

ISSN: 0144-6193 (Print) 1466-433X (Online) Journal homepage: https://www.tandfonline.com/loi/rcme20

Construction industry and economic growth in Singapore

George Ofori

To cite this article: George Ofori (1988) Construction industry and economic growth in Singapore, Construction Management and Economics, 6:1, 57-70, DOI: 10.1080/01446198800000007

To link to this article: https://doi.org/10.1080/01446198800000007

Construction Management and Economics, 1988, **6**, 57–70

Construction industry and economic growth in Singapore

GEORGE OFORI

School of Building and Estate Management, National University of Singapore, 10 Kent Ridge Crescent, Singapore 0511

The relationship between the construction industry and the economy in the course of national socioeconomic development has been studied by several writers. Singapore's recent advancement from a developing country to a newly industrializing one in less than a generation provides the opportunity to test some of these hypotheses. The article considers the role of the construction industry in Singapore's economy between 1960 and 1986.

After studying the part construction played in the development process and the resulting structural changes that occurred within the industry, direct investment in construction by the public sector and its use to influence the direction of the economy as well as facilitate efforts to improve the industry are discussed. Government's attempts to manage the development of the local construction industry and the nature of the industry at present are also considered. A chronological approach is adopted under each of the main parts of the paper.

Keywords: Development, infrastructure, middle-income, upgrade, downturn, export

Introduction

The transformation of Singapore within a generation from a typical developing country to an upper middle income newly industrializing nation provides the opportunity to study not only the role the construction industry played in creating the necessary infrastructure and contributing directly to economic growth, but also the changes that took place within the industry itself as it performed its dynamic tasks. The findings of writers including Strassman (1970) and Turin (1973) are compared with developments within the economy and the construction industry in Singapore during this period. Since most works on the subject of managing the improvement of the construction industry stress the role of the government, measures taken in this connection in Singapore, the factors giving rise to them, and their results are also studied. (Unless otherwise stated, all the figures quoted in this paper are in Singapore dollars and at constant 1968 prices.)

Construction and economic development

In nearly thirty post-independence years Singapore's economy has grown rapidly to become one of the world's most modern, diversified and dynamic. Gross Domestic Product (GDP) per capita at current market prices increased from $1306 in 1960 to $14 606 in 1986, a

0144–6193/88 $03.00+.12

compounded growth rate of 9.8% per annum. The construction industry has undergone some discernible structural changes as it helped in the development process. Turin (1973) suggested that unless the capacity of the construction industry of any country grew faster than the GDP the industry could constrain overall socioeconomic development. Table 1 shows some key statistics on the Singapore economy and construction industry. These are depicted in Figs 1 and 2. Over the period 1960–84 (before the recent downturn), value added in construction grew at a compounded annual rate of over 13%, surpassing the corresponding rate of 9% at which the economy expanded.

Capital formation in construction which, in the absence of data on gross output, indicates the size of the industry in Singapore, grew by over 33-fold from $121 million in 1969 to $4023 million ($12 098 million at current prices) in 1984 before declining to $2354 million ($7520 million at current prices) in 1986. Capital formation in construction comprised over half of Gross Domestic Fixed Capital Formation between 1960 and 1967, after which this proportion decreased progressively until it reached a low of just over 30% in 1974. It then stayed in the mid-thirties until 1981 when it started to rise again during the massive construction boom.

Turin (1973) observed a marked difference between the proportion of GDP contributed by the construction industry in developed countries and that in the developing nations: 5–8% and 3–5% respectively. This finding was largely confirmed by recent studies by Edmonds and Miles (1984) and Wells (1985). Edmonds (1979) suggested that as a prerequisite for

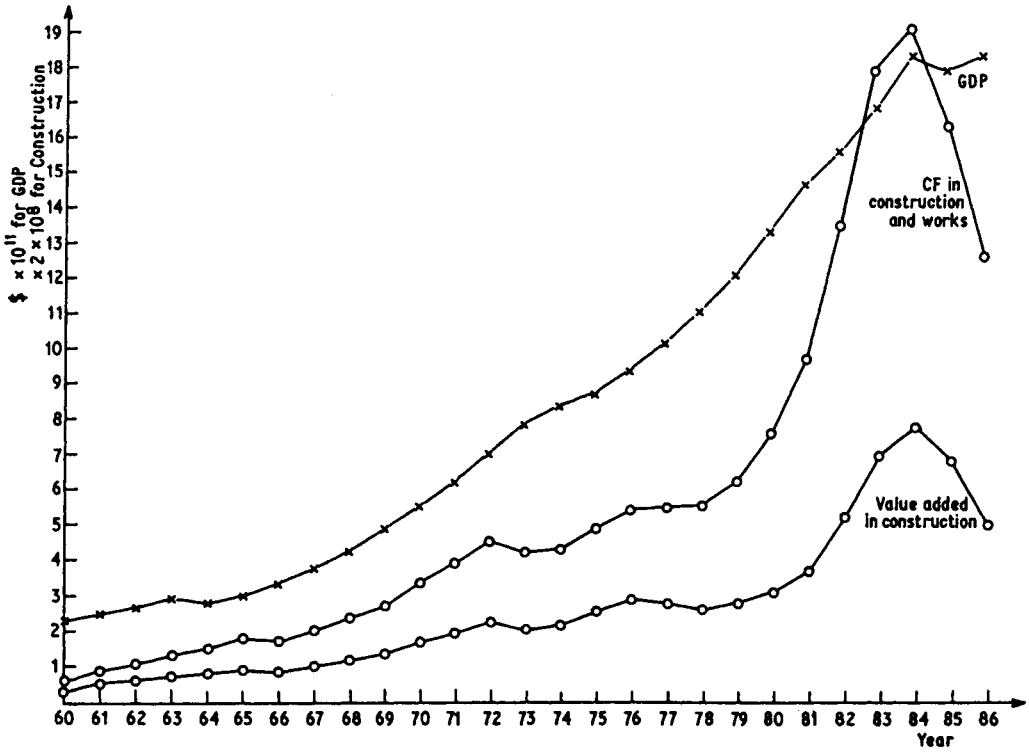

Fig. 1. Value added and capital formation in construction compared with gross domestic product.

continuous economic development, construction should contribute a minimum of 5% to GDP. In Singapore value added in construction increased from 3.5% in 1960 to 5.0% in 1963, and since then has remained consistently higher than or just below 5%. Over the period under review (1960–86) it was an average of 5.8%. This would appear to support Turin's observation, since Singapore is an upper middle-income country, as well as the hypothesis of Edmonds (1979). However, if construction output continues to decline as expected over the next few years and current optimistic projections for the economy prove correct the contribution of construction to GDP is likely to fall below 5%.

After studying the construction industries of all countries with a population of over 1 million over the period 1955–64, Strassman (1970) concluded that in the initial period of any country's development manufacturing is given a major boost for about two decades, after which construction catches up and becomes the major contributor to economic growth. Construction's role in the economy declines after the country reaches middle-income stage, owing to the industry's relatively high wages and low productivity. Apart from a reversal of the roles of construction and manufacturing for a brief period Strassman's hypothesis would appear to hold for Singapore.

During the initial period of infrastructural development (1960–5) construction was the fastest growing sector of the economy. Construction lost its pre-eminent role during the period of rapid industrialization starting from the mid-1960s. Between 1979 and 1984 the industry again expanded at a higher rate each year than any other sector of the economy. The

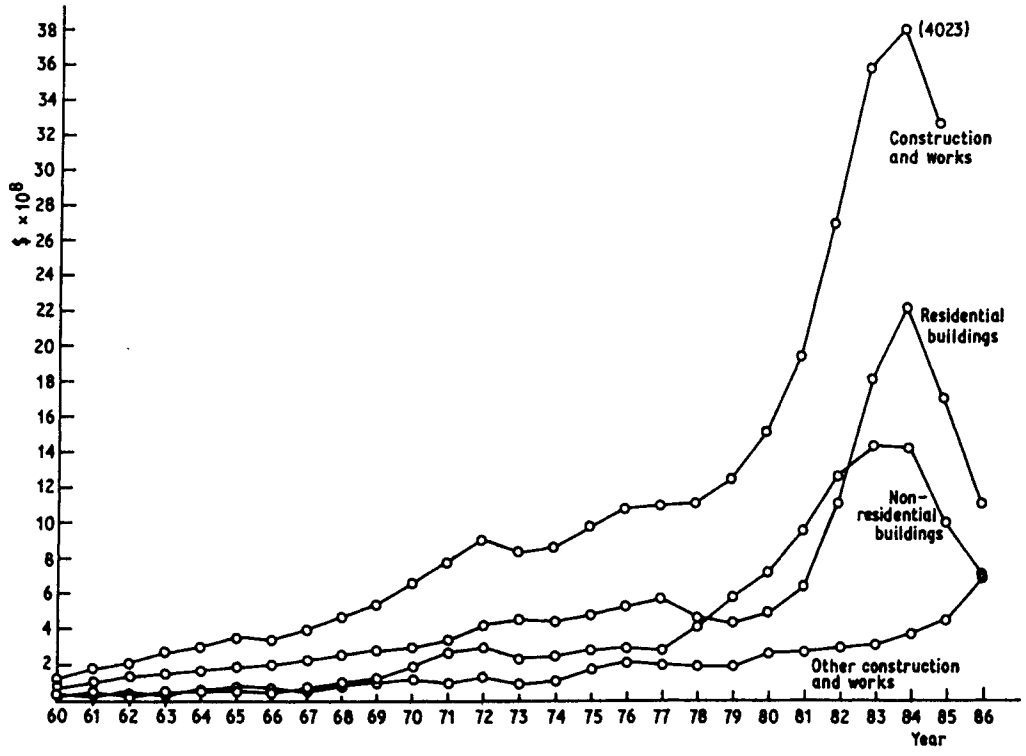

Fig. 2. Capital formation in construction and works.

Table 1. Construction in the economy of Singapore

	Constant 1968 Market Prices					Per Cent				
Year	GDP per capita $	GDP $ million	VA in Cn $ million	GDFCF $ million	CF in Cn & Wks $ million	Growth in GDP	Growth in VA in Cn	VA in Cn as % GDP	Growth in CF in Cn & Wks	CF in Cn as % GDFCF
1960	1400	2,304.5	80.1	219.9	121.0	—	—	3.5	—	55.0
1961	1467	2,497.4	111.2	317.2	179.2	8.4	38.8	4.5	48.1	56.5
1962	1526	2,671.6	122.3	378.4	210.9	7.0	10.0	4.6	17.7	55.7
1963	1637	2,938.0	145.8	467.7	265.2	10.0	19.2	5.0	25.7	56.7
1964	1540	2,835.6	167.3	567.0	314.6	−3.5	14.7	5.9	18.6	56.2
1965	1616	3,048.7	192.9	639.5	373.6	7.5	15.3	6.3	18.8	54.5
1966	1751	3,387.8	191.4	658.7	363.4	11.1	−0.8	5.6	−2.7	59.6
1967	1916	3,788.9	215.7	751.4	417.0	11.8	12.7	5.7	14.7	59.7
1968	2147	4,315.0	256.2	996.8	492.5	13.9	18.8	5.9	18.1	49.4
1969	2402	4,906.1	288.8	1,285.9	558.4	13.7	12.7	5.9	13.4	43.2
1970	2689	5,579.3	353.6	1,712.0	688.4	13.7	22.4	6.3	23.3	40.2

1971	2971	6,276.7	406.6	2,101.8	802.2	12.5	15.0	6.5	16.5	38.2
1972	3308	7,119.7	474.0	2,411.3	932.9	13.4	16.6	6.7	16.3	38.7
1973	3621	7,941.3	432.9	2,614.3	865.0	11.5	−8.7	5.5	−7.3	33.1
1974	3787	8,445.2	459.4	2,884.1	879.8	6.3	6.1	5.4	1.7	30.5
1975	3885	8,790.3	533.9	2,766.3	1,002.0	4.1	16.2	6.1	13.9	36.2
1976	4120	9,447.4	591.3	2,908.6	1,101.2	7.5	10.8	6.3	9.9	37.9
1977	4384	10,193.2	578.4	2,952.2	1,110.8	7.9	−2.2	5.7	0.9	37.6
1978	4705	11,074.0	536.1	3,333.0	1,122.4	8.6	−7.3	4.8	1.0	33.7
1979	5082	12,114.1	575.0	3,740.9	1,253.7	9.4	7.3	4.7	11.7	33.5
1980	5537	13,366.5	630.3	4,494.1	1,521.6	10.3	9.6	4.7	21.4	33.9
1981	6014	14.695.2	741.4	5,249.9	1,940.4	9.9	17.6	5.0	24.9	36.5
1982	6324	15,627.5	1,036.2	6,431.8	2,706.8	6.3	39.8	6.6	39.5	42.1
1983	6743	16,869.8	1,340.8	7,011.1	3,612.5	7.9	29.4	7.9	33.5	51.4
1984	7221	18,261.5	1,554.7	7,575.1	4,022.5	8.2	16.0	8.5	11.4	52.3
1985	7007	17,924.9	1,370.9	6,608.4	3,255.1	−1.8	−11.8	7.6	−19.1	49.3
1986	7068	18,256.8	1,009.6	5,824.2	2,534.0	1.9	−26.4	5.5	−22.2	43.5

Sources: Department of Statistics, Economic and Social Statistics of Singapore 1960–82; and Yearbook of Statistics 1986.
Abbreviations: GDP, Gross Domestic Product; GDFCF, Gross Domestic Fixed Capital Formation; VA, Value added; CF, Capital formation; Cn, Construction; Wks, Works.

economy was then maturing into newly-industrialized status. Construction output has fallen since 1985. As the building programme of the Housing and Development Board (HDB) tails off and major infrastructural projects, including the Mass Rapid Transit (MRT) system are completed, current forecasts point to continuous decline until 1988 when overall output is expected to stabilize at a lower level (Property Market Consultative Committee, 1986). Thus, the construction industry in Singapore experienced the 'middle-income country bulge' referred to by Strassman.

The mix of demand for construction activity has changed over the years. Infrastructural and housing development contributed the bulk of capital formation in construction in the early post-independence era. Non-residential building increased its share of capital formation from 20% in 1960–7 to 31% in 1968–75, 38% in 1976–80, and over 43% in 1981–4, mainly at the expense of residential building which declined from 59% to 51, 41, 43 and 46% respectively in the same period, the last two figures reflecting the accelerated mass housing programme of the early 1980s. In 1985–6 non-residential construction lost prominence. Residential construction was 52% of capital formation in 1985. As work on the MRT got under way, other construction and works accounted for 28% of capital formation in construction in 1986. Another indication that the Singapore economy has reached maturity is the increasing importance of repair and maintenance, which constituted an estimated 6% and 16% of total output in 1983 and 1985 respectively (Construction Industry Development Board, 1987). As the current stock of buildings and works increases and becomes older, repair and maintenance is expected to make up a progressively greater proportion of the workload of the industry.

Government's investment and intervention

Government's involvement and intervention in construction have been more obvious during periods of abnormally high or low levels of construction activity. Tables 2 and 3 list all years in which value added in construction grew by more than 20% or fell respectively, and outline the reasons for such growth or decline, and measures taken by government.

Economists disagree on whether governments deliberately use, or should use, public spending on construction to regulate the economy (Stone, 1983). In the case of Singapore, the government has, on occasion, made it clear that spending programmes for certain years or the commissioning of particular projects are intended to be reflationary (Ministry of Finance, 1976). Government has also acted to stimulate or depress demand from the private sector as it considered necessary.

Public sector investment in construction grew at a compounded rate of 27.5% in the early years of independence between 1959 and 1963. In 1972, in an attempt to reduce the high level of inflation in the industry, government not only reduced its expenditure in construction but also suspended the sale of public-owned sites for development (Urban Redevelopment Authority, 1983). The Residential Property Act No. 18 of 1976 which restricts the purchase or transfer of residential property to Singapore citizens and approved persons took effect from September 1973. This was followed by a credit squeeze and the introduction of a surcharge on property tax on items owned by foreigners (Wong, 1982). Stone (1983) and Hillebrandt (1985) have pointed out the difficulty of timing measures aimed at the construction industry to achieve the desired result. As later events would show, the actions taken in 1973 came at a time when perhaps the opposite was required. Demand for

Table 2. Declines in construction activity and action by government

Year of decline	Magnitude of decline[a] (%)	Reasons	Action by government
1966	Value added −0.8 Capital formation −2.7	Departure of Singapore from Federation of Malaysia and apprehension about the small country's survival.[b]	
1973	Value added −8.7 Capital formation −7.3	High construction costs. Apparent oversupply of property. World oil crisis and general pessimism about the global economy.[b] Bad weather: 1973 one of the wettest years on record in Singapore. Residential Property Act.	Pump priming by public sector (from 1974).
1977	Value added −2.2 Capital formation +0.9	Poor economic prospects. Slowdown in oil exploration and consequently in influx of expatriates.[b]	Public sector pump priming, levelling off in 1978.
1978	Value added −7.3 Capital formation +1.0		
1985	Value added −11.8 Capital formation −19.1	General national economic recession (GDP fell by 1.9%). Oversupply of all types of property after early 1980s booms.	Sale of public sites suspended. Several public sector projects brought forward. Contractors and consultants encouraged to seek projects abroad.
1986	Value added −26.4 Capital formation −22.2	Oversupply of property. Completion of several infrastructure projects. Curtailment of spending on public housing (after over 80% of the population were housed in them).	

Sources: [a]Calculated from: Department of Statistics, *Yearbook of Statistics 1986*, Singapore.
[b]Wong, K.P. (1982) *Essays on the Singapore Economy*. Federal, Singapore.

construction had, in fact, started to decline: the value of buildings commenced in 1972 was 32% less than the corresponding figure for the previous year. These measures led to a loss of confidence in the private sector and depressed its investments in construction until after 1978. The revocation of the tax surcharge and relaxation of the credit squeeze did not revive the interest of this sector.

Public sector expenditure on housing, land reclamation, harbour works, roads, a University campus and public utilities in 1974–8 were meant to arrest the slide in construction activity and general economic growth. This reflationary spending levelled off in 1979 although the public housing programme remained large. The commencement of

Table 3. Abnormally High increases in construction output and government action

Year of increase	Magnitude of increase[a] (%)	Reasons	Action by government
1970	Value added 22.4 Capital information 23.3	Good prospects for world and national economy. Influx of foreign investors, especially those dealing in the oil industry. Inflow of refugee capital from Malaysia for investment in residential accommodation.[b] Panic buying of property by locals fearing increases in land and house prices. High rates of speculation and inflation.[c] Prominence of tourism leading to a hotel boom.	Deregulation of prices of steel and cement. Lifting of tariffs and import quotas on key construction materials.[f] Attempts to create a local construction workforce. Relaxation of work permit regulations and introduction of measures to facilitate recruitment of foreign workers.[g] Suspension of sale of public-owned sites.[b]
1982	Value added 39.8 Capital formation 39.5	Amendment of Residential Property Act in 1982.	Recruitment of workers from non-traditional sources.[d]
1983	Value added 29.4 Capital formation 33.5	Accelerated mass housing programme. Relatively easy availability of funds at low interest rates.[d] Relaxation of rules on the use of Central Provident Fund savings to purchase property. Confidence in the economy with investment in offices, hotels and factories. Award of the first Mass Rapid Transit contracts.[e]	Construction Equipment Financing Scheme (1981), HDB Core Contactor Scheme (1982), Preferential Margin Scheme (1983) launched to increase construction productivity.

Sources: [a]Calculated from: Department of Statistics, *Yearbook of Statistics 1986*, Singapore.
[b]You, P.S. and Lim, C.Y. (eds) (1971) *The Singapore Economy*, Eastern Universities Press, Singapore.
[c]Shee, P.Y. (1976) Peculiarities of real estate investment in Singapore. In Motha, P. (ed.) *Valuation and Land Economy in Singapore*, University Education Press Singapore, pp. 159–164.
[d]Simon Lim, Oh and Partners (1983) *Property Market Review 1982/83*, Singapore.
[e]Simon Lim, Oh and Partners (1984) *Property Market Review 1983/84*, Singapore.
[f]Tsaw, P. (1974).
[g]Ow, C.H. and Goh, C.M. (1974) Meeting the building industry's labour requirements, *Proceedings of 3rd BEMS Seminar*, Singapore.

Changi Airport in 1980 marked another period of high government expenditure on construction projects. The first contracts for the Mass Rapid Transit System were awarded in 1983. The HDB's accelerated housing programme reached its climax in 1984 with the completion of 76 000 units.

The government's interest in the performance of the construction industry could be

attributed to the contribution of the sector to economic growth. On several occasions the industry had given the impetus for growth, contributing directly over a third of overall growth in some years. The role of construction as a possible vanguard in the development effort has been referred to by several writers. Dalton (1974) noted that a building industry which undertook public works was one of the leading sectors in Russia's economic development during the early eighteenth century. Riedel and Schultz (1978) included construction among the top four out of twenty economic sectors in terms of intersectoral linkages. Considering these linkages and the industry's high value-added to output ratio the World Bank (1984) suggested that construction provides a stimulus for growth throughout the economy. The inability of most developing countries, several of which currently face severe budgetary problems, to spend more on construction has been discussed elsewhere (Ofori, 1984).

Stone (1983) expressed doubts about the often-referred-to employment generating potential of public spending in construction. Schumacher (1973) and Drewer (1975) pointed out some of the pitfalls of massive increases in construction output by outlining the difficulties that could be posed by a construction programme which created additional wages without corresponding increases in the local production of goods that could be purchased with such wages. The situation in Singapore after 1985 demonstrated another danger inherent in the use of construction as the engine for economic growth. In that year the construction industry, which had spearheaded the expansion of the economy for several years, contracted, dragging down the rest of the economy with it.

> Even while the construction boom lasted, we should have become alarmed that a third of our economic growth each year derived from construction, as this trend obviously could not be sustained . . . the construction slump has brought us even more severe problems . . . [including] the contraction of aggregate domestic demand, resulting from the lower tempo of construction activities. This alone has contributed 2% points to the drop in GDP in 1985 . . . Also property loans by banks, and loans secured using property as collateral are at risk if property prices fall . . . banks with large property exposures will find themselves with a portfolio of non-performing loans . . . Further, a drop in investments in construction leads to an imbalance between our high national savings rate and lower domestic investment rates, with multiplier contractionary effects on the GDP. (Economic Committee, 1986, pp. 5–6)

The high levels of capital formation in the early 1980s were also disproportionately allocated between construction and equipment. Thus, the expansion of construction was at the expense of investments that would improve upon the economy's productive capacity and hence promote its future growth.

The economy grew by nearly 2% in 1986. However, despite attempts by government to stimulate demand for construction in the private sector while bringing forward a large number of public sector infrastructural projects, the output of the construction industry fell by 12%. Private sector investment in construction contracted by 46%. The public sector was responsible for about 75% of capital formation in construction. The economy performed more robustly in the first two quarters of 1987. Construction, however, continued its downward trend and demand from the public sector accounted for over 90% of its output. Thus, the recent declines in construction activity in Singapore have been in spite of, rather than the lack of, continued government spending, as happened in the United Kingdom in the late 1970s. As discussed below, the effect of this phenomenon on the industry in Singapore is similar to that pertained in Britain. However, unlike its British counterpart, the construction industry in Singapore has not yet developed the ability to export its services on a large scale.

The industry is very much younger and has no experience of a prolonged period of low demand. With most of the existing stock of construction items only recently completed, repair and maintenance cannot compensate for more than a fraction of the loss of new work. Worse, owing to the small size of the country the direct assistance the government can offer appears increasingly limited:

> the options open to the Government for stimulating local demand are more limited now . . . Pump priming through the construction sector has run its course. The US$2.5 billion subway system is well under way and cannot provide much additional impetus. The private construction sector has virtually collapsed under the weight of excess supply in virtually every property sector . . . In the public sector, the massive public housing programme passed its peak in 1984. (Embassy of the United States of America, 1985, p. 12)

The reasons for the declines in activity in Singapore are, again, different from those responsible for similar occurrences in developing countries, namely a weak economy unable to support the investment in much needed infrastructural and social projects and the provision of the industry's vital resources, most of which are imported (Ofori, 1984).

Managing the development of the industry

Since independence the government of Singapore has shown much interest in the well-being of the local construction industry.

Singapore's Development Plan of 1961–64 (Ministry of Finance, 1961) was unusual among such published spending programmes in its consideration of the implications of the planned expenditure for the local construction industry. The Plan established the basis for Singapore's development. It reviewed the performance of the industry in the preceding years and outlined measures envisaged for implementation in the early 1960s. Thus, the government appeared to agree with Lewis (1955) that the rate at which capital formation can be accelerated depends on how rapidly the building industry expands.

A major aim of the Plan was to create favourable opportunities for investment in the private sector, and thereby, attract suitable enterprises. The public sector would develop the necessary infrastructure to support the programme of industrialization: expanding power and water supplies, developing roads, port and communication facilities, and building industrial estates. Capital formation, which had constituted 10% of GDP in 1956, was expected to be about 20% of GDP in the Plan period.

Housing was to be accorded priority. It was estimated that some 14 000 dwellings would be required annually to relieve the acute shortage of housing and clear the slums. The HDB, which was then newly formed, was investigating the possibility of using new methods of construction including prefabrication. A school building programme was also to be launched. It was noted:

> The immediate impact of the Plan would fall on the building and construction industry. If both public investment and the private investment which it stimulates get under way, there could be the possibility of inflationary pressure on the capacity of the . . . industry. (Ministry of Finance, 1961, p. 55)

A Commission of Inquiry was set up in 1960 to assess the capacity of the local construction industry and to recommend ways and means of continuously monitoring and ensuring a balance between capacity and volume of construction activity. The most important factors

that had previously hindered the implementation of public sector projects were the difficulties encountered in the acquisition of land, and the absence of long-term planning. The first was to be solved through the promulgation of relevant legislation and the second by replacing the annual budgeting system, which then existed, with longer-term plans.

A review of the implementation of the Plan (Economic Planning Unit, 1964) showed that the concern expressed about the adequacy of local construction capacity was justified. In the first three years, total expenditure was $480 million compared to the total original provision of $651 million. This indicated a satisfactory achievement of nearly 74% of the spending target. Administrative inexperience and lack of trained technical personnel hindered the implementation of the Plan. In the road construction programme only $19 million of the target of $37 million had been spent. In drainage, 38% of the target had been spent, and on bridges the corresponding rate was 25%. In housing, however, the target was surpassed: $118 million was actually spent, compared with a target of $109 million and 29 365 units were completed in the three-year period as against a target of 26 521. The HDB completed 53 000 units in 1960–5, compared with the target of 51 000 units in the Plan. (Economic Planning Unit, 1964). The construction of school buildings also proceeded apace under a crash programme. Another major construction scheme in this period was the reclamation of the swamp lands and the creation of the Jurong Port and industrial estate which commenced in 1961.

The government seems to have made special efforts to ensure that the resources required by the construction industry were always easily available. During the upturn in activity in 1972 discussed above it removed price controls and import restrictions on vital construction materials (Tsaw, 1974), increased efforts to train more local personnel, relaxed work permit regulations for foreign construction workers, and the introduction of the 'block' application system which made it easier for contractors to recruit personnel from abroad. Similar measures were required a few years later:

> in 1979 and 1980, with further increases in oil prices, the construction industry experienced its worst inflation since . . . 1973/74. The tight construction labour market and shortage of building materials escalated construction costs by more than 30%. Wages increased by 47% while the prices of many building materials also increased sharply. (Wong and Yeh, 1985, pp. 206–7)

The state-owned Resources Development Corporation expanded its production of materials. To relieve the severe shortage of manpower the work permit rules were relaxed to enable contractors to recruit personnel from countries outside the traditional sources. The Construction Brigade, part of the civil defence scheme, was commenced in 1981 as part of the effort to develop a local workforce for the industry, an effort which involved the creation of different successive boards to coordinate training in construction skills, culminating in the establishment of the Construction Industry Training Centre in 1984.

The government's encouragement of, and support for, the technological development of the local construction industry is particularly worth studying.

In conjunction with a restructuring programme for the economy launched in 1979 which was aimed at phasing out activities with low value added, schemes for supporting the upgrading of local construction enterprises were implemented in the early 1980s. The Construction Equipment Financing Scheme (1981) provided soft loans through selected commercial banks to contractors to acquire specified plant and equipment on a hire-purchase basis. The HDB's Core Contractor Scheme (1982) gave a selected number of contractors a guaranteed minimum volume of serial contracts. The 15 core contractors were

awarded $420 million worth of contracts in 1986/7. The Investment Allowance Scheme enables contracting firms to set off agreed proportions of the value of the plant they purchase against tax, effectively allowing them to write off the items over a few years.

The Preferential Margin Scheme (1983) gives local firms and joint ventures in which local enterprises have a minimum of 25% stake, bidding preference (on a sliding scale) of up to 5% of the tender figure subject to a maximum of $5 million. In an effort to promote the transfer of technology the formation of joint ventures between local and foreign firms was encouraged for the execution of major construction projects including the MRT. As a result of these efforts to raise the level of technological development of the industry, productivity in construction increased rapidly in this period and construction prices remained relatively stable despite the very high level of activity.

Public sector projects were also used to introduce specific techniques into the local industry. Industrialized building methods have been used on most of the recent HDB projects and schools, and the use of metal scaffolding and modern formwork systems, steel for structural frames and energy-efficient materials for external walls have been encouraged.

However, it is not clear whether a basis for the continuous growth and development of a vibrant construction industry has been established. The HDB noted:

> Local contractors, while supportive of the Board's role, have . . . become increasingly reliant on the HDB for resource planning, supervision and coordination of subsidiary contracts. In planning ahead, the Board will thus have to ensure that its efforts in facing challenges in the three . . . areas (resource planning, supervision and coordination of subsidiary contracts) will not further this dependence but, on the contrary, help to create a pool of local contractors that is strong, resourceful and capable of carrying out all aspects of their construction work independent of the Board. (Wong and Yeh, 1985, p. 226)

The decline in construction activity since 1985 has resulted in a high rate of company failures, the loss of a large number of workplaces, the underutilization of contractors' plant and an erosion in the values of the shares of publicly listed contracting firms. The government's assistance to the industry has comprised: helping to reduce or contain the oversupply situation by suspending the sale of public-owned sites, halting commercial developments by statutory bodies, waiving levies for delayed completion of projects, and stimulating demand for property through further liberalization of the Central Provident Fund (CPF) rules; helping to reduce operating costs of enterprises, for example, by suspending the intended increase in the levy for foreign workers; and helping contractors and consultants to export their services. The various public agencies are taking advantage of the lull to review regulations and procedures relating to construction.

The industry

In response to the stimulus they obtained from meeting the demand for increasingly sophisticated buildings and works, and the direct assistance from the government, several construction firms in Singapore have progressed from small family-owned concerns into large entities using modern techniques of construction and management. Each of the five top local companies had a turnover of over $100 million in fiscal 1985. That of the leading company, Lum Chang Holdings, was $195 million (Walker Smith, 1986). The first construction firm was listed on the Singapore Stock Exchange in 1982: a total of five are currently listed.

Foreign construction companies, mostly Japanese and Korean, entered the Singapore construction scene in a big way in the later 1970s to undertake the large and technically complex building and civil engineering projects. They have played an important role in the industry, winning 23, 30 and 27% by value of contracts awarded in 1982, 1983 and 1984 respectively (Chestertons Lim, Oh and Partners, 1985). In 1986, of the 89 building and 114 civil engineering companies registered in the highest financial category, 66 and 60 respectively were foreign-owned (Construction Industry Development Board, 1986). Foreign companies have increased the overall level of competition, helped to keep down tender prices, transferred some technology, and indirectly forced local contracting firms to upgrade their operations. This penetration has, naturally, been resented by the local firms. The Contractors Association has frequently suggested that the influx and operations of foreign companies be restricted. Consultants have also reacted in a similar manner to the award of major projects to renowned architects overseas. With the current lack of construction projects, the foreign contracting firms have been gradually winding down their operations as the outcry against them became even more vehement.

Singaporean contractors and consultants are gearing themselves towards exporting their services, especially to countries in the Asia–Pacific region. Despite some assistance from a special unit created within the Construction Industry Development Board, and although a number of companies have won projects in various nations, this venture will be difficult as the firms are likely to meet stiff competition from larger, more experienced foreign enterprises which have greater governmental and institutional support. Furthermore, export is an option available to only a few of the enterprises in Singapore. Most construction firms in Singapore currently face a grim future.

Conclusion

The construction industry has played an important role in the economy of Singapore. It established the infrastructure required for sustained socioeconomic development while being a major contributor to overall economic growth in most years. Most of the hypotheses on the role of construction in development would appear to be supported by the experience of Singapore. The government's awareness of the industry's importance and needs, and the direct support it provided have been considerably beneficial to the sector, helping it to fulfil its tasks efficiently and effectively.

The construction industry currently faces severe difficulties relating especially to a very low level of demand. Future prospects for it are also not bright. Singapore's uniqueness makes it difficult to draw parallels with, and derive lessons from, the experience of other countries. The country seems to be in danger of losing a large part of the construction industry which it has painstakingly built up, despite a commitment on the part of the government to help the industry to overcome its problems. It would be instructive to study the nature of the construction industry which emerges from the current slump.

References

Chestertons Lim, Oh and Partners (1985) *Property Market Review 1984/85*, Singapore.
Construction Industry Development Board (1986) *CIDB Directory of Contractors 1986*, Singapore.

Construction Industry Development Board (1987) *Maintenance and Retrofitting Market: Opportunities and Implications*, Singapore.

Dalton, G. (1974) *Economic Systems and Society*, Penguin, London.

Drewer, S. (1975) *The Construction Industry in Developing Countries: A Framework for Planning*, University College Environmental Research Group, London.

Economic Committee (1986) The Singapore economy: new directions, Ministry of Trade and Industry, Singapore.

Economic Planning Unit (1964) First Development Plan 1961–64: Review of Progress for the Three Years Ending 31st December, 1963. Prime Minister's Office, Singapore.

Edmonds, G.A. (1979) The construction industry in developing countries, *International Labour Review* **118**, 3, May–June, 355–69.

Edmonds, G.A. and Miles, D. (1984) *Foundations for Change: Aspects of the Construction Industry in Developing Countries*, Intermediate Technology Publications, London.

Embassy of the United States of America (1985) Economic trends report: Singapore.

Hillebrandt, P.M. (1985) *Economic Theory and the Construction Industry* (2nd edn), Macmillan, London.

Lewis, W.A. (1955) *The Theory of Economic Growth*, London.

Ministry of Finance (1976) *Economic Survey of Singapore 1975*.

Ministry of Finance (1961) *Development Plan 1961–64*, State of Singapore.

Ofori, G. (1984) Improving the construction industry in declining developing economies. *Construction Management and Economics*, **2**, 127–32.

Property Market Consultative Committee (1986) *Action Plan for the Property Sector*, Ministry of Finance, Singapore.

Riedel, J. and Schultz, S. (1978) *Construction and Building Materials in Developing Countries*, Weltforum Verlag, Munich.

Schumacher, E.F. (1973) *Small is Beautiful*, Abacus, London.

Stone, P.A. (1983) *Building Economy* (3rd edn). Pergamon, Oxford.

Strassman, W.P. (1970) The construction sector in economic development. *Scottish Journal of Political Economy*, November, 390–410.

Teh, C.W. and Yeoh, H.H. (1974) The HDB and the building economy. In *Proceedings of the 3rd Building and Estate Management Society Seminar*, University of Singapore, 59–72.

Tsaw, P. (1974) Control of building material prices. In *Proceedings of the 3rd Building and Estate Management Society Seminar*, University of Singapore.

Turin, D.A. (1973) *Construction and Development*, University College Environmental Research Group, London.

Urban Redevelopment Authority (1983) *Chronicle of Sale Sites*, Singapore.

Walker Smith, P. (1986) CIDB top 20 local construction companies. *CIDB Review* **2**, 4, October–December.

Wells, J. (1985) The role of construction in economic growth and development. *Habitat International* **9**, 1, 55–70.

Wong. K.P. (1982) *Essays on the Singapore Economy*, Federal Publications and Nanyang Siang Pau, Singapore.

Wong, A.K. and Yeh, H.K.S. (eds) (1985) *Housing a Nation: 25 Years of Public Housing in Singapore*, Maruzen Asia, Singapore.

World Bank (1984) *The Construction Industry: Issues and Strategies in Developing Countries*, Washington, DC.