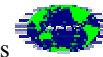


**SMEs AND ELECTRIC INDUSTRIAL MACHINERY AND
APPARATUS IN MALAYSIA**

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1. INTRODUCTION

Small and medium scale industries (SMIs) have been argued in the past to be better allocators of resources due to their incapacity to influence prices. The effects of competition from small resources is also considered to force SMIs to operate at optimal factor utilization limits. Recent works have added further support for SMIs due to the scope and flexibility offered by smallness. The myth of the large corporation posited by Pratten (1971), Chandler (1985) and Scherer (1970) to enjoy the capacity to reap minimum scale efficiency is now increasingly questioned (see Audretsch, 1999; Best, 1999). This debate is still unclear as size structures of firms in different industry groups still vary, even if a number have become increasingly lean.

Small firms, given their infancy, competitiveness in particular industries and critical role in assisting large firms, have often figured strongly in government support. The special advantages offered by smallness such as economies of scope, flexibility, lower capacities has often been the basis for special loans administered by financial institutions in the developed economies, including Japan, Chinese Taipei and South Korea. Where the regulatory framework discouraged the growth of efficient small firms in industries such as machine tools where small size is important, their performance have generally been dismal. The inflexible *chaebols* of South Korea have failed to generate efficient machine tool production so that the country continues to face high imports in domestic demand. While Chinese Taipei enjoys effective state support – especially in supporting institutions that solve collective action problems – its greater reliance on small private firms operations has stimulated the rise of machine tool exports. Malaysia has faced more uncoordinated regulatory industrial policies, which in general have not directly enhanced the performance of local machine tool firms.

However, the success of firms in particular settings cannot just be explained by size. *Inter alia*, industry differences and the coordination networks firms embed also explain why firms succeed sometimes and fail sometimes. The latter has become increasingly important following the growing knowledge disparity (creation and appropriation) between sites, which is particularly significant in the electronics and related industries where the miniaturization process and product cycles have evolved exponentially.

While there is growing support for leaner firms and industrial organizations where the division of labor inside firms have become shorter and that between firms longer,¹ it has been argued such trends only occur in locations where effective institutional networks exist. Also, given the potential for government failure, firms have also often resorted to systemic relationships that require business-coordination of government support. The Silicon Valley (Saxenian, 1997), Keihin District (Best, 1990) and Emilia

¹ Which leads to Young's (1928) classic dictum that while the division of labor is dependent on the size of the market as argued by Smith (1776), the size of the market is also dependent on the division of labor.



Romania (Brusco and Sabel, 1982) are examples of relatively successful examples of effective industrial networks.

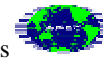
For a number of reasons problems of measurement and the regulatory environment often leads to an understatement of performance by SMIs. In Malaysia, there is a general bias of the regulatory environment towards bigger firms. Generous financial allowances for export-oriented big firms in such strategic industries as electric/electronics often qualify for substantial tax exemptions. Tax exemptions in Malaysia may actually encourage transfer pricing out of profits, causing inflated performances (e.g. profits). SMIs may deflate their performance (e.g. value added) rates, while reporting their capacity expansion figures (e.g. employment and investment). Firms with a paid capital of less than RM2.5 million enjoy registration waivers and thus no serious government scrutiny. Also, often efficient SMIs expanding operations will graduate upwards to larger scale categories shifting the positive bias towards big firms, and the converse declining firms the negative bias towards SMIs. Hence the data used in the paper must be treated with caution.

This paper attempts to show the growth and performance of the electrical machinery and apparatus firms in Malaysia based on size. The first part of the paper presents crucial policy instruments and the growth in significance of the electric/electronics industry within overall electric/electronics and manufacturing in Malaysia. The second part analyzes the growth and performance of particular size groups in the electrical machinery and apparatus industry, which constitutes the international standard industrial classification (ISIC) 5-digit code of 38310.

2. SMIs AND THE REGULATORY ENVIRONMENT

The development of SMIs in Malaysia's manufacturing sector was initially constrained by weak government support instruments. During colonialism, the British introduced financial support for small and craft industries under the Rural Industrial Development Authority (RIDA), largely to reduce discontent among the Malays (see Rasiah, 1995: chapter 3). Such lukewarm initiatives were continued with greater financial support after independence under the Rural Development Ministry. It was not until the late 1970s that official policy attempted to earmark SMIs for support, albeit its development remained uncoordinated and cumbersome until SMI activities were given direct prominence by the Ministry of Industrial development following the launching of the Industrial Master Plan in 1986. The umbrella concept of marketing – originally introduced in 1983, was augmented with the Subcontract Exchange Program (SEP) in 1986 and the Vendor Development (VDP) Program in 1992. In addition to the extension of export-oriented double tax deductions to SMIs from 1986, the government introduced the Industrial Technical Assistance Fund (ITAF) and complementing credit guarantee supports as well as matching efforts in the late 1980s. A separate Small and Medium Industries Development Corporation was incorporated in the 1990s to govern their activities.

However, official state policy tended to discourage local SMIs with size above mandatory registration levels as the experienced ones were dominated by Chinese



ownership. It is only in locations where complimentary local state power and better government business coordination has helped the development of better SMI supplier firms. Given the lack of such politico-business alliances beyond Penang, the share of establishments in the manufacturing sector with size less than 50 employees have fallen over the period 1985-95 (see Rasiah, 1999). The contribution of SMIs in generating investment, value added and employment in Malaysia's manufacturing sector has also generally fallen in the period 1985-95 (see Rasiah, 1999). Firms with size exceeding 200 employees, have gradually expanded their grip on value added.

Being generally small and medium in size and dominated by Chinese ownership, the local machine tool firms faced the same fate. Much of the initial federal support for the evolution of machine tool firms came indirectly, and in some sense fortuitously. There were no clear effort to attract electronics firms with the purpose of spawning local firms when the government first launched its export-oriented industrialization policy following the Investment Incentives Act (IIA) in 1968. Electronics components multinationals only began relocating in Malaysia after the Free Trade Zone Act was enacted of 1971 and the subsequent opening of the zones in 1972. National Semiconductor — the first semiconductor firm to commence operations in Malaysia — built its factory in Bayan Lepas in 1971 and started production in 1972. Government efforts to woo export-oriented manufacturing firms have been critical at least in four important ways:

- The federal government's free trade zone (FTZ) legislation offered financial benefits in the form of:
 - a. pioneer status — which gave tariff exemptions on imports and exports, and tax holidays over a period of five to ten-years. Firms were thus exempted from corporate income tax of 35 per cent and development tax of 5 per cent;
 - b. Upon expiry of the pioneer status, firms have often been granted investment tax credit (ITC)² which has given further tax exemptions for five to ten years. The exemptions have been equivalent to approved investment. Losses during the allowance period can be replaced after the period;
 - c. Where FTZs could not be established, licensed manufacturing warehouses (LMWs) have been established. LMWs enjoy similar privileges as firms located in FTZs;
- Amendments to the Employment Act of 1955 in the late 1960s and the Industrial Relations Act of 1967 imposed tighter controls on labor organization. The government did not allow unions in the electronics industry until 1989 when in-house unions were first allowed. Several firm managements still refuse to recognise some of these in-house unions;

² This allowance was renamed the Investment Tax Allowance following the Promotion of Investment Act of 1986.

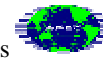


- Government leaders offered unofficial guarantees to safeguard multinational corporate interests to ensure effective production coordination (e.g. for power supplies and customs regulation);
- The local state government offered subsidized land, water, electricity and other physical infrastructure.

While the potential for the development of SMIs emerged following the growth in demand generated from the relocation of foreign electric/electronics subsidiaries, the regulatory environment generally disadvantaged their development until the late 1980s. Large firms enjoyed considerable advantage over small firms in their access to pioneer status, ITC, FTZ and LMW incentives. The initial wave of electronics component firms to Malaysia was also of large size with employment exceeding 500 employees. As a symbolic gesture the Penang government opened Penang Electronics in 1970. National Semiconductor of the United States in 1971 was the first semiconductor firm to build its factory in Malaysia. Japanese owned Clarion was the first foreign electronics component firm to start operations in Malaysia in 1971. A combination of lucrative incentives directed at firms generating larger employment and investment levels, and the labor-intensive production technologies associated with electronics assembly in the 1970s and early 1980s skewed the industry towards large firms (see Rasiah, 1993; 1996). Local private initiatives were initially constrained by official policy directives under National Economic Policy (NEP), which with the promulgation of Industrial Coordination Act (ICA) in 1975, discriminated non-Bumiputera entrepreneurs. Firms with an employment size of 25 and above and a paid up capital of 250,000 were required to obtain licensing, often requiring compliance with national ethnic restructuring conditions. Also, local non-Bumiputera firms also hardly enjoyed access to incentives.

Given the lack of production experience in electronics components making prior to the 1970s, local initiatives in the industry only began to emerge from the 1970s. With the exception of showpiece industries and other scattered small-scale efforts, local involvement in electronics component manufacture did not grow much until the late 1980s. Being small and largely owned by local Chinese capital, electronics component firms generally enjoyed little state support. Smaller local owned electronics firms only received strong impetus only following its classification among the promoted industries in the Industrial Master Plan of 1986. Being complementary to the operations of the strategic industries such as electronics, the industry enjoyed similar incentives, though, the extent of foreign direct investment was extremely small. The Promotion of Investment Act of 1986 offered the industry equal duty exemptions if located in free trade zones (FTZs) or licensed manufacturing warehouses (LMWs) and export incentives such as the double tax deduction on exports and export credit refinancing.

Under such circumstances, domestic policy have tended to be biased toward large industries. The global glut in 1984-86 forced several small electronics firms to close, especially local ones. Penang Electronics and Penang Printed Circuit Boards were a few of them. The only foreign casualty of that period, Mostek which assembled Dynamic



Random Access Memories (DRAM), was sold to Thomson CSF which later sold it to International Device Technology.

Thus, federal policy instruments generally discouraged the growth of small and medium electronics component firms in Malaysia. Against this general trend nationally, changes in production organization especially from the mid-1980s began to change the size configuration of electronics component firms in Malaysia. With considerable assembly and test upgrading, as well as, aspects of redesigning taking place in Malaysia, local state initiatives began to stimulate the development of institutional networks to enable greater deepening in Malaysia. Penang state was arguably the most advanced in pursuing such opportunities. Government-business initiatives led to the formation of the Penang Skills development Center (PSDC) in 1989. Several other aspects of infrastructure were strengthened so that firms could externalize substantial aspects of production, which was internalized in the past due to the uncertainties associated with the local structure. Such production segments were dissimilar but complementary to the operations of the main electronics component firms in Malaysia. The lack of similar strong networks in the Kelang Valley and Johore discouraged strong development of electronics component SMIs. Singapore's strong institutional network enabled the relocation of SMIs in Johore to service firms located across the causeway.

With the exception of Penang, local electronics component SMIs in the rest of Malaysia generally faced constraints accessing government support. Under such circumstances, SMIs that have had a long entrepreneurial experience and show potential linkage development effects - dominated by ethnic Chinese ownership - have enjoyed little state support. Chinese owned small and medium electronics component suppliers faced considerable problems in their efforts to supplier multinationals in locations outside Penang. The lack of state support has left them facing severe market failure problems - though ethnic congruence with the generally ethnic Chinese purchasing officers in the multinationals have encouraged some amount of local sourcing. Not only are electronics component multinationals badly positioned to identify small and medium scale firms' potential capabilities as it would require detailed scrutiny and monitoring, they themselves have received little encouragement to participate in such developments, which can be risky and uncertain. Hence, outside Penang, little links were forged between foreign multinationals and local SMIs in the electronics components industry. They not only face finance problems - including accessing subsidized loans and technical assistance from the credit guarantee schemes and the industrial technical assistance fund (ITAF) - but are also hardly prominent to attract the attention of potential multinational clients. Indeed, interviews show that the list of small and medium scale firms promoted by the government include relatively few machine tool firms operating in the Kelang Valley. Where it has involved active state promotion, such as those by the *Bumiputera* venture trust, Permodalan Usahawan Nasional Berhad (PUNB) stringent ethnic-based conditions apply.

The lack of political support has restricted the establishment and strengthening of sourcing relationships between microelectronics multinationals and local machine tool firms. The intermediary coordination role played by the PDC in Penang has been missing in the Kelang Valley. Lacking state efforts through institutionalization of risks



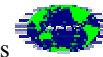
and other support services, microelectronics multinationals in the Kelang Valley reported lacking motivation to develop local machine tool capabilities. Unlike in Penang where a proactive state leadership has played a critical role in stimulating links between local firms and multinationals, state leadership in other parts of West Malaysia has generally avoided such a role (see Rasiah, 1998a). Since the federal state, *de facto* has generally been the active governance agent in the rest of West Malaysia, national considerations embedded in the NEP and its successor, the national development plan, have dictated the promotion of local sourcing. *Inter alia*, ethno-class has differences restricted the effectiveness of the nationally coordinated SEP. Its success in stimulating subcontract relations between ethnic Chinese firms and microelectronics multinationals have been modest even after the enactment of the 30 per cent local sourcing condition in 1991 for firms applying to enjoy financial incentives. Yet 2763 firms had registered under the SEP by 1993 (Malaysia, 1994: 260).

The federal state has only been slightly more successful than SEP in its promotion of the VDP involving the electric/electronics industry. Anchor companies began to support small and medium firms with an equity of not less than RM100 thousand that show *Bumiputera* participation in equity and employment of 70 per cent and 55 per cent, however, respectively. Participation in this program within the electronics industry has so far largely involved consumer and industrial electronics firms. Few of them, however, has established links with microelectronics firms. Sapura and Sharp were the initial anchor firms. This program has helped create *Bumiputera* controlled suppliers from scratch within a short time in the electronics industry. The government planned to create 80 new vendors over the sixth and seventh Malaysia plans (Vijaya Letchumy, 1993: 14). Subsidized loans and technical assistance offered through ITAF and venture companies such as PUNB have been critical in their development.

Socio-political divergence in the Kelang Valley - between the small and medium business community and UMNO dominated political leadership both at the state and federal levels - stifled the development of complementary institutions to support the growth of ethnic Chinese controlled small and medium scale businesses. With weak inter-ethnic relations at the small and medium scale level, the Chinese business community involved in metal, tooling, foundry, rubber and later electronics and plastic works enjoyed little support to grow. Federal financial incentives associated with support for SMIs too failed to stimulate the growth of local SMIs comparable to Penang. Hence, the few successful electronics component SMIs in the rest of West Malaysia have tended to be foreign owned.

3. GROWTH AND PERFORMANCE OF ELECTRICAL MACHINERY AND APPARATUS FIRMS

In light of the general bias of government policy towards large firms, it is only natural that the relative contribution of SMIs to overall electrical machinery and apparatus industry would be expected to be considerably weaker than Chinese Taipei where large firm biases were generally avoided. This section presents the contribution of the electrical machinery and apparatus sub-sector to overall electronics and manufacturing output, the relative contributions of the different employment size



categories to the number of establishments, value added, employment and fixed assets, and growth and performance of these categories.

The total number of electrical machinery and apparatus establishments grew from 20 in 1988 to 116 in 1995. Firms with employment size less than 50 employees contributed 55.0 per cent of the establishments in 1988, the share falling to 26.9 per cent in 1992 before rising to 60.3 per cent in 1995 (see Figure 1). The size category of 200-499 employees contributed the next highest, 19.2 per cent in 1988 and 12.1 per cent in 1995. Firms with size of 1,000 and were the least in number, contributing 3.4 per cent of total firms in 1995. The data from the statistics department shows no firms at all in the 500-999 employment category in 1988-89.

The total value added of the electrical machinery and apparatus industry in 1985 prices, rose from 67.4 million ringgit in 1988 to 343.8 million ringgit in 1995. Firms with employment size less than 50 employees 200-499 contributed most to electrical machinery and apparatus value added in the period 1988-89 and 1994 (see Figure 2). Firms with employment size exceeding 1,000 employees was the leading contributor in 1990-91 and 1995. Firms with employment size 500-999 was the leading contributor in 1992. The value added contributions to the total of size categories 50-99 was the least by 1995, followed by 100-199 and 1-49 employment categories. The fluctuations within size categories 200-499, 500-999 and 1000 and above employees could be a consequence of firms moving in and out of size categories.

The electrical machinery and apparatus industry contributed total employment of 2,783 employees in 1988, reaching 18,318 employees in 1995. Firms with employment size of 1,000 and more contributed most to electrical machinery and apparatus employment in 1988 and the period 1990-95 (see Figure 3). There was substantial alternation between size categories of 500-999, 200-499 and 100-199 for second place, suggesting considerable movement of firms depending on their end of the year employment figures. Firms in the smaller size categories of 1-49 and 50-99 generally contributed least to overall electrical machinery and apparatus employment.

The total fixed assets of the electrical machinery and apparatus industries increased from 48.0 million ringgit in 1988 to 315.0 million ringgit in 1995. Firms with employment size 200-499 was the largest contributor in the period 1988-89, followed by employment category 100-199 (see Figure 4). The 200-499 employment category also contributed most to total fixed assets in 1994. Employment size 100-199 owned the largest amount of fixed assets in total fixed assets in 1990. Firms of employment size of 1,000 and more became the largest contributor in the period 1991-93 and 1995. These fluctuations could be a consequence of firm turnovers, and others moving up and down in along the employment categories.

The measurement of growth rates and productivity is somewhat affected by a decline in electronics production in 1995, the end year used. The production of especially semiconductors fell in 1995 following a dip in global demand (see Figure 6). A global glut caused prices to fall. Since the problem is considered to affect all size categories, the relative performance of each of the size categories can still be compared.



The contribution of the electric/electronics industry to manufacturing value added fell from 29.8 per cent in 1994 to 28.9 per cent in 1995), after rising from 15.3 per cent in 1986.

Table 1 presents the growth rates of total factor productivity (TFP), value added, inputs, labor and capital. It can be seen that firms with employment size exceeding 1000 grew the fastest in value added and factor inputs. Firms with employment size 200-499 achieved the second highest average annual growth in value added, followed by firms with size of less than 50 employees. Firms with employment size 50-99 employees recorded the second highest growth in inputs, followed by firms with size 500-99 employees. The salaries and wages of size categories 0-49 and 500-999 recorded the second and third highest average annual growth. Firms of size 0-49 employees faced the second highest growth in fixed assets accumulation, followed by size category 50-99 employees.

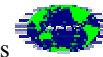
Using TFP as a measure of performance, size categories 50-99, 0-49 and 500-99 employees have done the worst, recording sharp declines in disembodied technical efficiency. Firms with employment size of 100-199 employees followed by firms with employment size 1000 and more employees have outperformed the others. Along with employment size 200-499, these are the only three categories to record TFP growth in the period 1988-95. There is also no clear pattern of TFP growth.

Interviews with officials from three firms each in all of the size categories shows that the first two categories of 0-49 and 50-99 are characterized by relatively higher turnover rates, firms ceasing operations as well as firms graduating to higher employment size categories following expansion. Hence, these two size categories may have been severely affected by relatively newer firms as well as some successful ones moving on to higher size categories. Most of the firms in these categories perform simple subcontract operations for larger firms, specializing in lower value added activities. Most firms in these categories do not enjoy financial incentives

Firms in size categories 100-199 and 200-499 are engaged in both subcontract as well as original equipment activities for export markets. Products assembled include power driven machinery, automated and other electrical machinery. Most of the firms in these categories are foreign owned and enjoy export-oriented incentives. Some enjoy investment tax allowances. Except for 1994-95 when some firms expanded and moved from employment size category 100-199 to 200-400, the number of firms in these categories have been stable with gradual increase in new firms over the years.

Interviews suggest that some firms in size category 500-999 performed badly, while others expanded operations in the period 1990-95. Two firms graduated to size category 1000-1999 in the year 1995. The negative performance of the size category which included electrical machinery assemblies, also included the onset of a downturn in 1995.

Firms in size category 1000 and above employees enjoyed a positive TFP growth. Apart from gaining from the entry of growing successful firms, the category,



which is dominated by some of the world's leading electronics component assemblers, also benefited from the market access and technological sophistication of these firms. Firms in this category assemble particularly disk drives. Seagate and Komag are some of the firms in this category. Some firms, such as Seagate also undertake redesigning of older slider products, and considerable process flow and design research.

While the general specialization of firms in each of the employment size categories in different products suggest that scale effects may still be important, further research is necessary before such a statement can be concretized. Future research should also examine the movement of particular cohorts of firms in each of the size categories before the conjectures introduced earlier can be refuted or defended. It should also be noted that there has been a trend rationalization in the industry. For example, the average per firm employment fell in 1995, largely from a decline in the largest category of employment size of 1,000 and more (see Figure 5). This category experienced a sudden rise in the period 1991-94 due to the relocation of labor-intensive disk drive firms. Overall, it seems that scale may still be important, but its effects are gradually waning from the extent of externalization made possible by developments in networks.

Table 1: Average Annual Growth by Employment Size, 1988-95 (constant 1985 prices)

Size	TFPG	VA	Inputs	Labor	Capital
1-49	-13.29	10.25	15.13	23.86	36.69
50-99	-22.53	3.28	30.50	11.01	25.66
100-199	3.69	2.46	-4.22	6.37	-0.22
200-499	0.36	21.88	22.95	17.63	21.15
500-999	-5.52	18.49	26.79	23.09	20.05
1000-	3.30	52.22	37.29	47.01	68.24

Source: Computed from Data Supplied by Statistics Department.

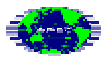


Figure 1: Distribution of Establishments by Employment Size, 1988-95

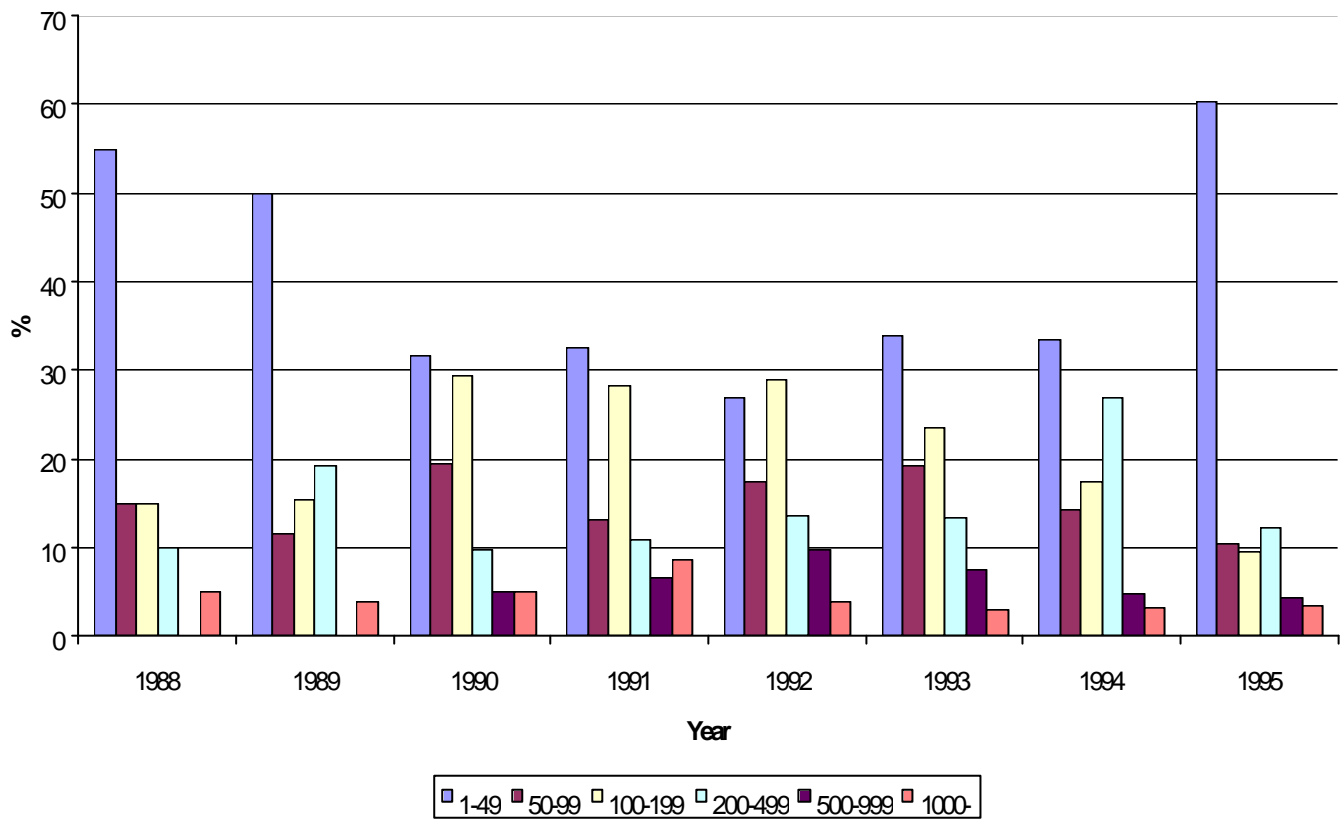
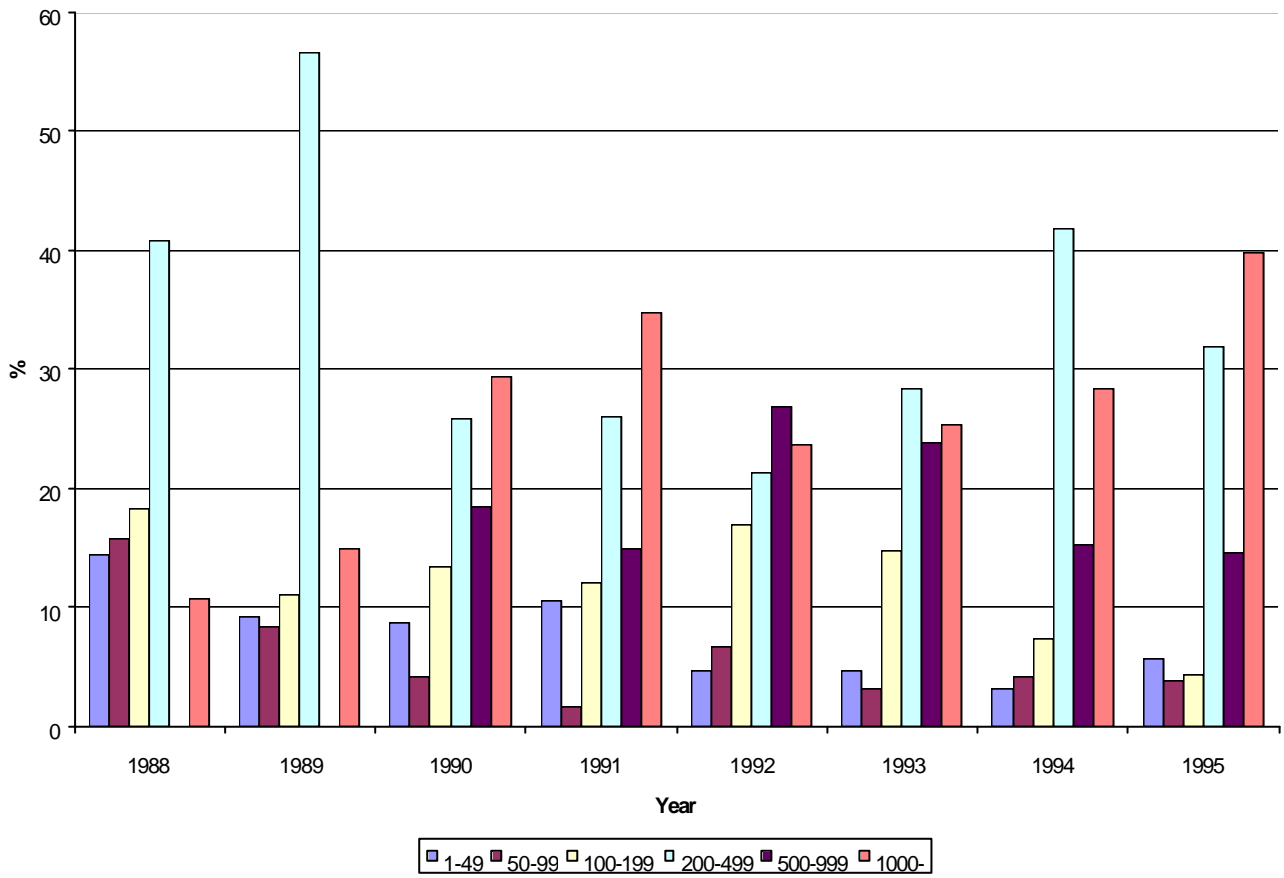


Figure 2: Distribution of Value Added by Employment Size, 1988-95



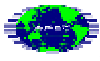


Figure 3: Distribution of Employment by Size, 1988-95

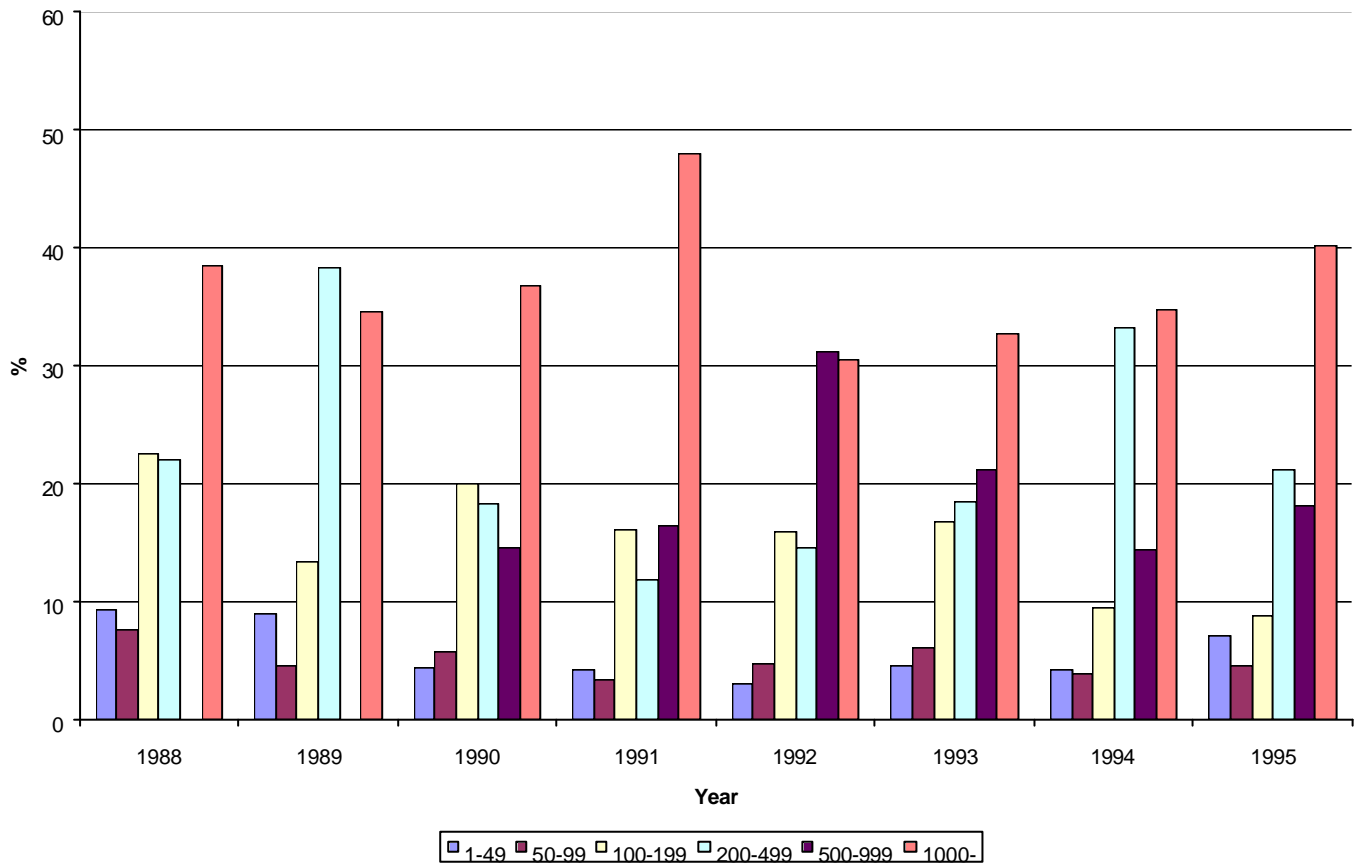
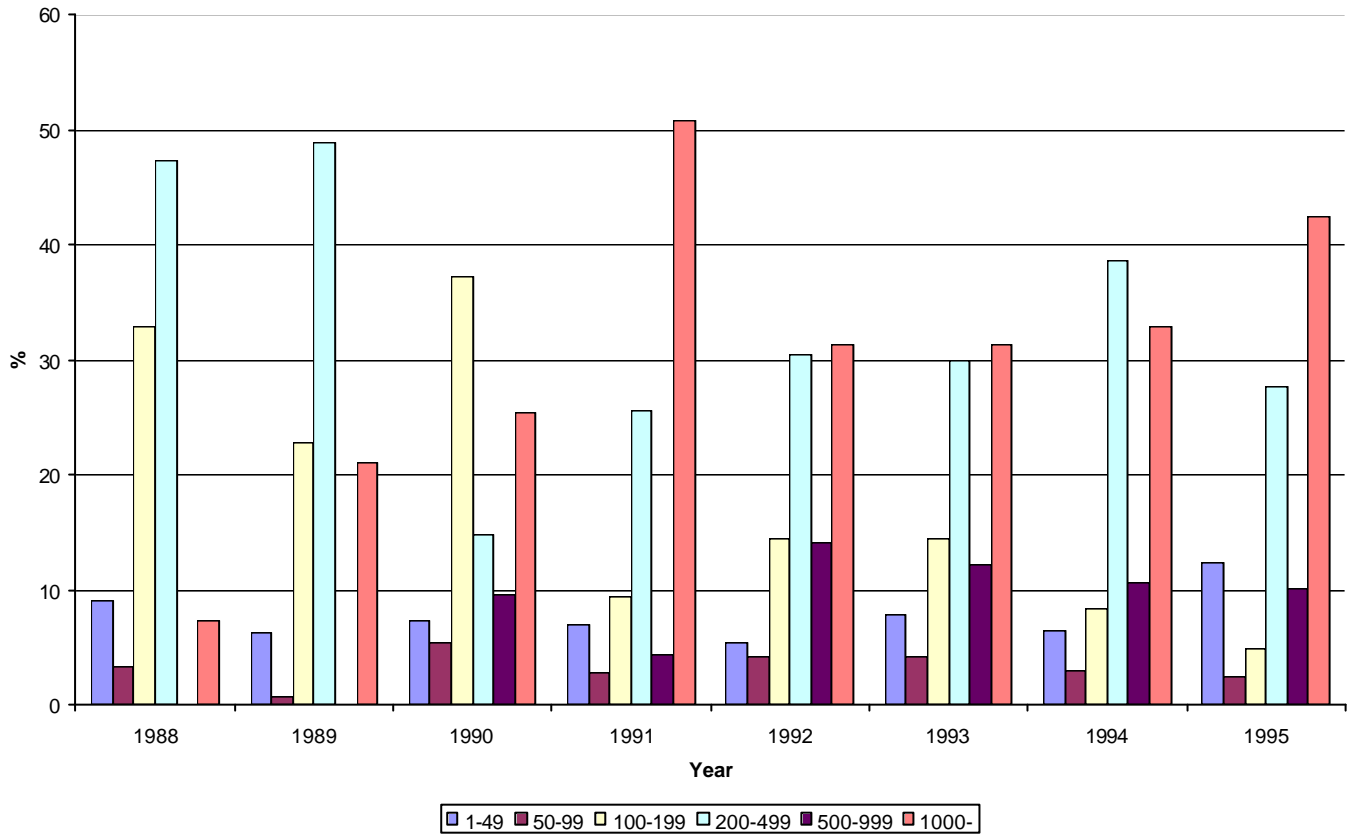


Figure 4: Fixed Assets Distribution by Employment Size, 1988-95



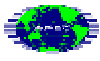
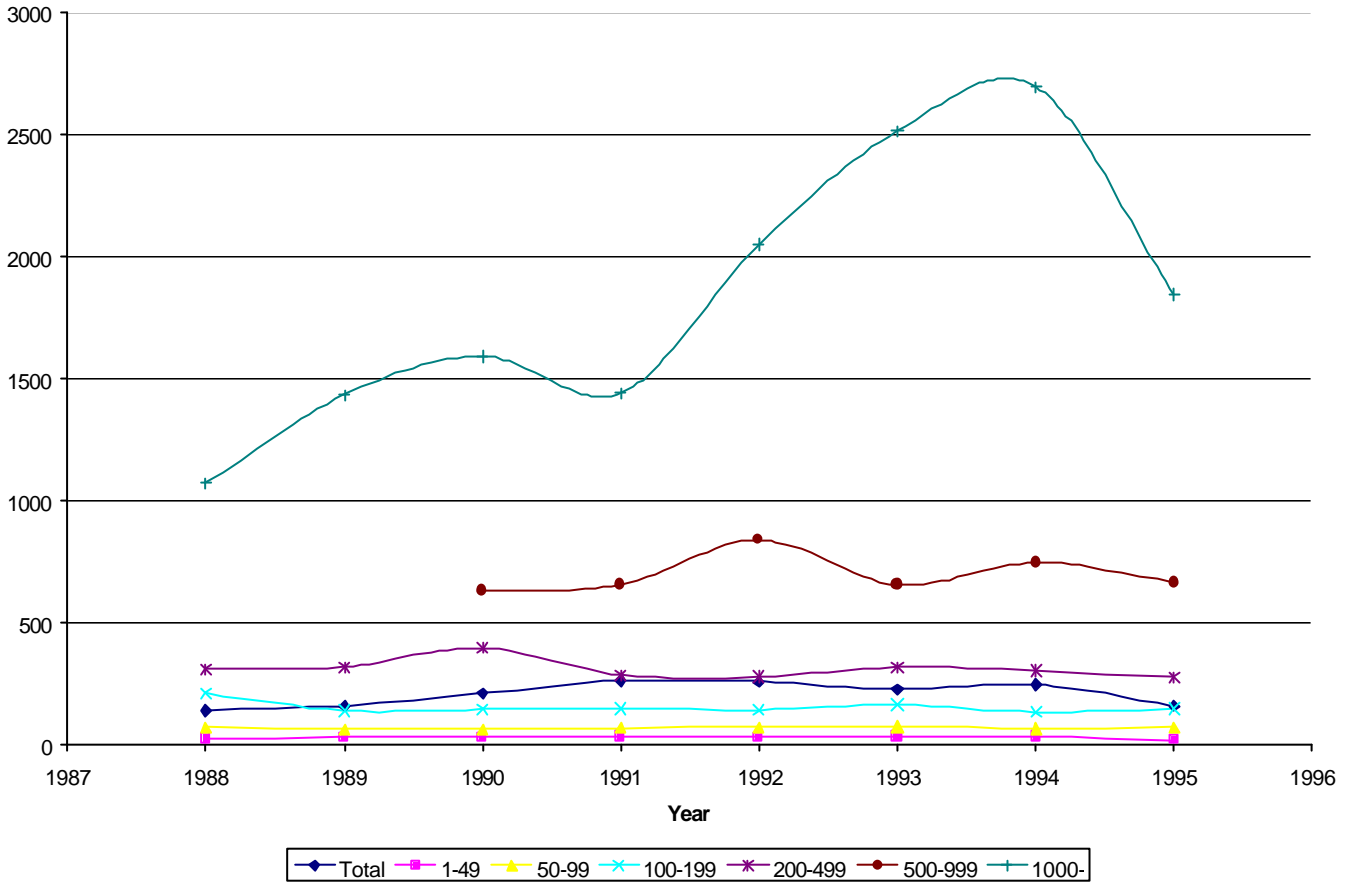
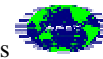


Figure 5: Average Per Firm Employment by Size, 1988-95





The rationalization tendencies with falling employment size began first in the electronics components sub-sector. Its spillovers following buyer-supplier links with other industries as well as exhaustion of labor reserves in West Peninsular Malaysia, led to similar developments in the electrical machinery and apparatus sub-sector. The general work organization began to change strongly from the 1980s in the electronics components firms (see Rasiah, 1995). Especially in semiconductor production - where product cycles have become increasingly shorter and prices have fallen sharply - firms began to introduce rapid changes in work organization. Most high technology firms began to introduce flexible production systems - superimposing cellular manufacturing onto state-of-the-art human resource techniques such as total quality management (TQM) (Rasiah, 1987; 1994). From the late 1980s, the larger electrical machinery and apparatus firms irrespective of ownership began introducing flexible production techniques, integrating innovative capacity with execution throughout the division of labor - thereby reducing hierarchies and making them interlock in the process. The sharp fall in labor reserves from the late 1980s left even disk drive firms to turn to flexible production strategies (Rasiah, 1995; 1996).

Off-shore production involving electronics multinationals in Malaysia had transformed from a mobile off-shore activity (Lim, 1978; Rasiah, 1987) - to a deep-rooted regional operation (Rasiah, 1987; 1988). The growth of product and process customization within the rapidly growing Asia Pacific market enhanced such a development further. These developments - particularly to enable productive flexible specialization - has encouraged a strong impetus for proximate local electrical machinery and equipment sourcing and the intensification of employee training in-house and externally. Currency fluctuations too were important but as Rasiah (1994) has argued, they accompanied rather than initiated such developments. Some elements of research and development in the redesigning of mature products such as the 80386 and 80486 microprocessors and EPROM chips has also emerged to tap the direct externalities generated out of the development of local labor's innovative faculties and changes in financial incentives (Rasiah, 1996a). Interestingly the appreciation of the ringgit after 1992 reversed the exchange rate advantage.

Using direct and indirect (cutting edge process techniques) proxies such as quality control circles (QCCs), small group activities, just in time (JIT), quick change overs and multi-product lines, total quality management (TQM), total preventive maintenance (TPM) and statistical process control (SPC), the timing of application of flexibilization of production. A detailed time-series presentation of the absorption of flexible production techniques into both electrical and non-electrical machinery firms is undertaken in Rasiah (1994: Figure 2).

The analysis in this section did not establish any clear pattern of growth and performance in electrical machinery and apparatus industry with employment size. Compared to general international statistics, SMIs in the electrical machinery and apparatus industry tend to contribute less to the number of establishments. Their contributions to value added, fixed assets and employment have generally been smaller but the pattern again is not obvious. Employment size categories of 100-199, 200-499 and 1000 and more show positive TFP growth, while the rest negative. While the dip in



1995 could have affected overall performance, the size categories of 1-49, 50-99 and 500-999 have performance dismally. The smaller categories seem to be affected by high turnovers and the graduation of successful firms to bigger groups. The large category of 1,000 and more employees have benefited considerably from the relocation of giant disk drive companies.

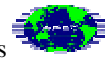
5. CONCLUSION

This paper broached the role of SMIs in Malaysia's manufacturing sector, with specific reference to the electrical machinery and apparatus industry. The overall lack of effective government support for SMIs was advanced as a major drawback that has reduced the contribution of SMIs in the manufacturing sector. Government incentives have clearly shown a strong bias towards larger firms.

Relatively complementary local socio-political structure helped enhance effective coordination between markets, institutions and firms to enhance the development of small and medium scale firms in Penang. The specific nature of local politics in Penang, and the local political leadership's relative autonomy over the federal government helped the local state to support ethnic Chinese small and medium scale businesses more actively. The special intermediary role of the Penang Development Corporation has been instrumental in forging strong state-business-multinational coordination. Thus, markets, trust and in-house command worked complementarily to coordinate the expansion and deepening of machine tool subcontracting firms in Penang. Although similar federal policies also faced other locations in West Peninsular Malaysia, weak development of institutional networks restricted the expansion of similar electrical and electronics SMIs. The local state offered little proactive support the growth of SMIs and to forge links between electronics multinationals and local electrical machinery and apparatus firms. The official vendor development programs promoted by the federal governments have remained under-utilized.

As a consequence the growth and performance of electrical machinery and apparatus SMIs in Malaysia have fallen short of their bigger counterparts, albeit the firms compared tend to fall in slightly different product groups. Apart from holding small contributions to value added, employment and fixed assets, the employment categories of 1-49 and 50-99 also show highly negative TFP growth in the period 1988-95. The poor performance could also be attributed to high turnovers and graduation of some successful firms to larger categories. However, the pattern is unclear as the best performers were size categories 100-199 and 1000 and more employees. The employment category of 500-999 also recorded negative TFP growth. Also, the largest category also benefited from the relocation of American disk drive firms in the 1990s.

The results suggest tentatively the significance of the relationship between industry type and scale in firm level performance. However, a more rigorous individual firm level assessment using the same firms historically is essential for more definite conclusions. Also, the scope and flexibility offered by smallness may still be relevant if it can be established that these firms have graduated to larger categories over time.

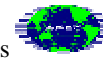


REFERENCES

- Alt J.E. and Chrystal K.A. (1983) *Political Economics*, Berkeley: University of California Press.
- Best M. (1990) *The New Competition*, Cambridge: Harvard University Press.
- Chee P.L, Lee D. and Foo R.T. (1981) "The Case of Labour Intensive Industry in Malaysia", Amjad R. (ed), *The Development of Labour Intensive Industry in ASEAN Countries*, Bangkok: International Labour Organisation.
- Chee P.L. (1986) *Small and Medium Industries in Malaysia*, Kuala Lumpur; Forum Press.
- Coase R.H. (1937) "The Nature of the Firm", *Economica*, 16(4): 386-405.
- Doner R. (1991) "Approaches to the Politics of Economic Growth in Southeast Asia", *Journal of Asian Studies*, 50(4): 818-49.
- Evans P. (1992) "The State as Problem and Solution: Predation, Embedded Autonomy, and Structural Change", Haggard S. and Kaufman R.R. (eds), *The Politics of Economic Adjustment*, Princeton: Princeton University Press.
- Haggard S. (1990) *Pathways from the Periphery: The Politics of Growth in the Newly Industrializing Countries*, Ithaca: Cornell University Press.
- Helpman E. and Krugman P.R. (1989) *Trade Policy and Market Structure*, Cambridge: MIT Press.
- Hirst P. and Zeitlin J. (1991) "Flexible Specialization Versus Post-Fordism Theory: Evidence and Policy Implications", *Economy and Society*, 20(1).
- Hua W.Y. (1983) *Class and Communal Politics in Malaysia*, London: Zed Press.
- Jomo K.S. (1986) *A Question of Class*, Kuala Lumpur: Oxford University Press.
- Kaldor N. (1979) "Equilibrium Theory and Growth Theory", Boskin M.J. (ed), *Economics of Human Welfare: Essays in Honour of Tobor Scitovsky*, New York: Academic Press, pp 271-91.
- Kamal S. and Young M.L. (1985) "Penang's Industrialization: Where do we go from here", Paper presented at the "Future of Penang Conference", Penang.
- Khan M. (1989) "Corruption, Clientelism and the Capitalist State", Unpublished doctoral thesis, Cambridge University, Cambridge.
- Khong S.M. (1991) "The Service Sector in Malaysia: Structure and Change", Unpublished doctoral; thesis, Cambridge: Cambridge University.



- Lim L.Y.C. (1978) "Multinational Firms and Manufacturing for Export in Less Developed Countries: The Case of the Electronics Industry in Malaysia and Singapore", Unpublished doctoral thesis, Ann Arbor: Michigan University.
- Lucas R.E. (1988) "On the Mechanics of Economic Development", *Journal of Monetary Economics*, 22: 3-22.
- Malaysia (1971) *The Second Malaysia Plan 1971-1975*, Kuala Lumpur: Government Printers.
- Malaysia (1976) *The Third Malaysia Plan 1976-1980*, Kuala Lumpur: Government Printers.
- MIDA (1988) *Investment in the Manufacturing Sector: Policies, Incentives and Procedures*, Kuala Lumpur: Malaysian Industrial Development Authority.
- Malaysia (1994) *Ministry of International Trade and Industry Report*: Kuala Lumpur: Government Printers.
- Mardon R. (1990) "The State and Effective Control of Foreign Capital: The Case of South Korea", *World Politics*, 43(1): 111-38.
- Munro (1964) "Untitled mimeo" Penang.
- North D.C. and Thomas R.P. (1970) "An Economic Theory of the Growth of the Western World", *The Economic History Review*, 22(1): 1-17.
- PDC (1971) *Annual Report*, Penang: Penang Development Corporation
- Rasiah R. (1987) *International Division of Labor* (translated from Malay), Master's thesis, Universiti Sains Malaysia (Published in 1993 by Malaysian Social Science Association)
- Rasiah R. (1988) "The Semiconductor Industry in Penang: Implications for NIDL Theories", *Journal of Contemporary Asia*, 18(2).
- Rasiah R. (1994) "Flexible Production Systems and Local Machine Tool Subcontracting: Electronics Component Multinationals in Malaysia", *Cambridge Journal of Economics*, 18(3): 279-98.
- Rasiah R. (1995) *Foreign Capital and Industrialization in Malaysia*, New York and London: St Martin's and Macmillan.
- Rasiah R. (1996) "Industrialization as Engine of Growth and Industrial Policy in Malaysia", *Managerial Finance*, 9(2).
- Rasiah R. (1996a) "Changing Organisation of Work in the Electronics Industry in Malaysia", *Asia Pacific Viewpoint*, 37(1): 21-38.



- Rasiah R. (1996b) "Innovations and Institutions: Moving Towards the Technological Frontier in the Electronics Industry in Malaysia", *Industry and Innovation*, 3(2): 79-102.
- Rasiah R. (1997) "Class, Ethnicity and Economic Development in Malaysia", Rodan G, Hewisen K. and Robison R. (eds), *Political Economy of South-East Asia*, Melbourne: Oxford University Press.
- Rasiah R. (1998) "From a Backyard Workshop to a Modern Machine Tool Factory: Eng Hardware", Jomo K.S, Felker G. and Rasiah R. (eds), *Looking Inside the Black Box: Industry Technology Development in Malaysia*, London: Routledge.
- Rasiah R. (1998a) "Politics, Institutions and Flexibility: Microelectronics Transnationals and Local Machine Tool Linkages", Doner R. and Deyo F. (eds), *Flexible Specialization in Asia*, Ithaca: Cornell University Press.
- Richardson G.B. (1960) *Information and Investment*, Oxford: Oxford University Press.
- Richardson G.B. (1972) "The Organisation of Industry", *Economic Journal*, 82(3): 883-96.
- Sabel C. (1986) "Changing Models of Economic Efficiency and their Implications for Industrialization in the Third World", Alejandro C.F.D. et al (eds), *Development, Democracy and the Art of Trespassing*, Notre Dame: Notre Dame University Press.
- Saham J. (1980) *British Industrial Investment in Malaysia 1963-1971*, Kuala Lumpur: Oxford University Press.
- Sengenberger W. and Pyke F. (1991) "Small Firm Industrial Districts and Local Economic Regeneration: Research and Policy Issues", *Labour and Society*, 16(1).
- Vijaya Letchumi (1993) "SMI Development Programmes", paper presented at MITI/MIDA/FMM seminar, "Domestic Investment in the Manufacturing Sector", Penang.
- Wilkinson F. and You J.I. (1992) "Competition and Cooperation: Towards an Understanding of the Industrial District", Small Business Research Centre, Working Paper No. 88, Cambridge University, Cambridge.
- Williamson O.E. (1985) *Markets, Hierarchies and Relational Contracting*, New York: Free Press.