

**Restructuring without Upgrading:
A Sociological Study on Hong Kong Electronics Industry,
1978-1996.**

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Abstract

This paper seeks to make sense of Hong Kong's peculiar upgrade trajectory over the past two decades by a social-organizational approach with special reference to the electronics industry. The puzzle: the industry never took advantage of its earlier lead to catch up with the regional race by moving towards high value-added activities, only to excel in contract manufacturing for low-profit, large-volume items. My contention: there persists an organizational form whose contribution to its early success in international subcontracting also constitutes its later failure in industrial upgrading. Interestingly enough, its stagnation in the subcontractor role is full of dynamics at both the field and firm levels. With the electronics field connected to the international subcontracting network from the outset, those who secure close contact with overseas buyers are best posited to set up an industrial firm. With the vast majority of industrial entrepreneurs arising within this subcontracting network, the industrial field saw the rapid rise of an organizational form that is set to excel in the subcontractor role at the expense of other tasks. As it unfolds, collective preoccupation with international subcontracting turns into collective inaction in industrial upgrading. But Hong Kong could have significantly upgraded its industrial base by linking with other networks of global division of labor had there emerged alternative organizational forms, given the abundant business opportunities over the past decade. However, the proximate institutional context has always been less supportive to these alternative organizational forms, depriving the electronics industry of a critical mass that could have made a difference in its upgrade performance. In sum, Hong Kong's peculiar path to industrial upgrading is rather a result of social selection than market competition.

撮要

本文以電子業爲例，從組織層面探討香港過去二十多年來在工業升級的表現。這問題有趣之處在於香港電子業雖然其起步甚早，卻未能緊跟亞洲其他三小龍的升級步伐，一直只替國際買家大量生產低檔產品。本文發現這問題的徵結在於大量的電子企業都跟從一種組織模式——加工廠模式，其運作方式有利於香港在國際買家市場中穩佔一席，卻不利於工業升級。這種組織模式的興起與香港在戰後的工業發展模式有莫大關係。香港的貿易港地位，令本地廠商成功打入國際買家市場，亦令得本土的加工業日益蓬勃。隨著大量有相關工作經驗的人成立加工廠，大部份廠商只專注替國際買家加工，全香港電子業愈向加工業傾斜。然而，這只指出了香港電子業未能升級的一面。香港的制度環境未能促進其他組織模式成長，也是電子業未能把握八十年代以後大量的升級機會的根本原因。

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CHAPTER ONE

SOCIALIZING ECONOMIC TRANSFORMATION

THE PUZZLE: WHY FRONTRUNNER FINISHES LAST

The rapid rise of East Asia has lured so many scholars that post-war industrialization in the so-called "four little dragons" -- Hong Kong, Singapore, South Korea and Taiwan -- has been a hot topic in development studies for more than two decades. But despite their apparent similarity in early industrialization, the 1980s saw such a sharp diversity among their paths to economic restructuring that Hong Kong turns out to be an underachiever in industrial upgrading. Should we take their contrasting upgrade performances into serious consideration, an exceptional case like Hong Kong deserves much research attention. This thesis therefore seeks to make sense of Hong Kong's peculiar upgrade trajectory by a social-organizational approach with special reference to the electronics industry.

East Asian Model Untangled

Earlier researches on the phenomenal economic growth of East Asia generated a complex literature, in which four major streams can be identified: free-market thesis, state-centered approach, neo-modernization theory and global perspective (Chiu et al. 1997: Chapter 1). Taking the region as an unit of analysis, adherents of the above strands each developed an "East Asian Model" by looking for the "crucial similarity" among the four NIEs through different lens. First of all, free-market advocates like Balassa (1988) and Milton and Rose Friedman (1980) highlight the well-functioning market mechanism where price signals allocate resources efficiently and effectively. Yet this view is challenged by statisticians including Johnson (1987), Amsden (1985) and Wade (1988) who stress that the state in these economies each plays a much more

active and extensive role in the socio-economic transformation than free-market advocates assume. Beyond the market-versus-state debate are neo-modernization theorists, who embrace cultural categories like Confucian heritage (MacFarquhar 1980) and family entrepreneurialism (Wong 1988). Meanwhile, the global perspective just takes the "Asian Miracle" as another restructuring of the international political economy in the Post-War era (Dicken 1992; Henderson 1989).

Even though the literature made a great contribution to the account of East Asian development, its focus on the regional level obscures diversity among economies. The market-versus-state debate is illustrative enough, with free-market advocates like Milton and Rose Friedman (*ibid.*) selectively highlighting the case of Hong Kong whereas statisticians like Johnson (*ibid.*) tend to ignore this former British colony. Not surprisingly, doubts remain as to whether there is *one* development model in East Asia (see, for examples, Dowling 1994; Kuznets 1994 and Perkins 1994).

Such diversity becomes more apparent as we shift the focus from industrialization to industrial upgrading. As an example, UNCTAD (1996) compares the export pattern of Asian NIEs over the 1963-90 period, and singles out Hong Kong for its loss of market share in almost half of the highly dynamic products in which it had earlier built a strong market presence. Echoing this point, Chow and Kellman (1993) note that while all the four NIEs have successfully upgraded their exports from labor-intensive and resource-based products to more technology-intensive ones through the mid-60s to early 90s, Hong Kong had the least structural transformation of commodity composition of exports over the period. With the other three NIEs having dramatically upgraded their local industrial bases in one way or another (Chiu 1994), it is puzzling that Hong Kong has stuck with labor-intensive manufacturing for over three decades (Chiu et al. 1997).

Before we move on to the next section to take a closer look at their contrasting upgrade performances with reference to the electronics industry, I must first point out that "industrial upgrading" takes a rather broad definition in this paper. This key concept comprises three dimensions: 1) *product upgrade* means moving towards high-value added products without altering the technology content, as for examples, by cosmetics design, brand development and quality enhancement; 2) *process innovation* refers to upgrading the production process of existing products by increasing automation, using a new quality control system and redesigning the production system, to name but three; and 3) *technology catch-up* means approaching the world's technology frontier by acquiring a state-of-the-art technology, commercializing an emerging technology and so on. Taking industrial upgrading as a continuous process, this paper assesses how much upgrade a locality has achieved in which aspect instead of whether upgrade is achieved.

Electronics Industry as a Crucial Case

This paper follows the convention in the field to define the electronics industry broadly as the sector that designs and/or manufactures electronic components and/or products containing electronic components (see, for example, Reif and Sodini 1997)¹. Defined this way, the electronics industry poses a crucial case on Hong Kong's upgrade performance as much for its outstanding achievement in the territory as for its vivid illustration of the contrasting performances among the four NIEs².

¹ Not only does the definition ensure comparability, but its broadness is also justified on three grounds: 1) it captures the very nature of electronics firms in Hong Kong (and also in the region) that a clear-cut boundary can hardly be drawn; 2) it includes a wide range of products to facilitate a study on industrial upgrading; and 3) it increases the diversity of the population to fit the research focus -- the prevalence of a set of organizational characteristics across industrial sectors in a locality.

² The outstanding performance of electronics industry is quite a consensus in Hong Kong. For examples, Kwong (1997) finds it among a few other industries that have significantly upgraded technology amid massive relocation, Ng (1990) also highlights its remarkable improvement in

The Hong Kong electronics industry was one of the frontrunners in East Asia -- by the late 1950s a few multinational corporations (MNCs) have started production in Hong Kong. The territory, if not a leader, kept up with the other three NIEs by the 1970s, only to fall behind in the regional race since the structuring era in the 1980s. Quite a number of studies record a resemblance between Hong Kong electronics industry and its counterparts in the other three NIEs until the mid-80s (Ernst and O'Connor 1992; Hobday 1995; McDermott 1992). Assembly of simple consumer gadgets was a common entry point; Hong Kong had been one of the world's leaders in transistor radio assembly in the early 1960s, when electronics industries around the region were not much different. McDermott (1992) vividly describes this early scene:

"[E]arly in the 1960s, the electronics industry in South Korea and Taiwan consisted of a small number of indigenous manufacturers producing vacuum-tube radios for the domestic market ... by the end of the 1960s, the electronics sector of both countries had a much wider product range and had shifted its focus to export markets ... in the late 1970s, the electronics industry of both countries was skewed towards consumer rather industrial electronics" (p.212-3).

Indeed, the four NIEs all relied on foreign buyers for technical assistance and market outlets in the 1970s when their electronics industry took off (Hobday 1995).

The diversity became increasingly apparent only in the 1980s, the restructuring era in which the emergence of new protectionism in the West together with the rise of new low-cost competitors in Asia forced the four NIEs to reorient their development strategies (Chiu 1994). South Korea and Taiwan were subsequently found to be the most effective in building a globally competitive electronics industry, but Hong Kong was still not far behind by the mid-80s in terms of both production value and technology level (Ernst and O'Connor 1992: 95-180). However, over the next decade,

productivity over the 1980s, and Hong Kong Census and Statistics Department (1997) even names it the best performer among all manufacturing industries over the past decade in terms of labor productivity.

Hong Kong stagnated mostly as a contract manufacturer for low-end consumer gadgets in the mid-90s. Meanwhile, Taiwan has transformed itself into one of the market leaders in various fast-growing sectors including notebook and desktop computers, optical scanners, multimedia cards and high-speed modems, to name a few notable examples (*Business Week* May 6, 1996). Likewise, South Korea has turned into a powerhouse in consumer electronics, as well as a key supplier for such key components as LCD (liquid crystal display) and CRT (cathode ray tube)³. In addition, both South Korea and Taiwan have made a bold step ahead in technology catch-up, for example, by developing a dynamic semiconductor industry at home (Hong 1992).

The difference in restructuring strategies helps account for such contrasting upgrade performances, as the four NIEs all adapted to the restructuring era by a combination of three strategies. This strategy set includes: first, expanding outward investment and relocating production processes in other developing countries; second, raising the level of regional integration in trade; and third, increasing the value-added content of their exports and upgrading their industrial structure (Chiu 1994). Throughout the last decade South Korea has vigorously shifted its emphasis from "imitation strategy" towards "innovation strategy" by intensifying in-house R&D (Kim 1997). Likewise, Taiwan has been keen on acquiring cutting-edge capability in various technology areas such that a globally oriented strategy is now a real possibility for a handful of firms (Lee and Pecht 1997). Even Singapore has developed locally a world-class engineering capability in spite of the predominance of MNCs, as for example, strong precision engineering industries have been built up around the HDD (hard disk drive) sector (Wong 1996). Given Hong Kong's heavy

³ LCD serves the display function in a wide range of gadgets from calculators to laptop computers,

reliance on the relocation strategy (Chiu et al. 1997), its failure in realizing upgrade possibilities throughout the restructuring era is not particularly surprising. But here we arrive at a real puzzle -- why did Hong Kong take such radically different restructuring strategies from the other three NIEs?

BEYOND THE MYTH OF FREE MARKET

Hong Kong's peculiar choice of restructuring strategy may not sound astonishing since the former British colony has so often been highlighted across the region, if not the world, as an open economy with minimum state intervention. Along with the colonial administration which publicizes its so-called "positive non-interventionism" (Haddon-Cave 1982), a vast literature attributes its economic success to a well-functioning free market (Chau 1993; Friedman and Friedman 1980; Lin and Ho 1980; Mok 1997; World Bank 1993; Woronoff 1986). But as I am about to demonstrate, the free-market thesis obscures rather than clarifies Hong Kong's restructuring experience no matter how coherent its analysis seems at first glance.

In line with the portrayal of Hong Kong as a free market, its trade pattern along with the industrial structure has been considered to be a confirmation to the principle of comparative advantage (Ho 1992; Lin and Ho 1980; Mok 1997). Early industrialization by export-oriented manufacturing had everything to do with abundant labor supply, whereas economic diversification away from labor-intensive activities since the 1970s reflected eroding cost advantage. So did its transformation into a regional service center in the 1980s when land and labor costs were surging. All in all, economic development in Hong Kong has so far demonstrated efficient allocation of resources by following the evolution of comparative advantage.

whereas CRT has so far been the prominent type of color picture tube for TV and computer monitors.

But whether the manufacturing industry took the "upgrade" or "relocation" route, it left Hong Kong with those activities that utilize a higher capital/labor ratio than labor-intensive manufacturing, confirming the principle of comparative advantage! To avoid circular reasoning of this kind, the free-market thesis has a perfect partner in the size-limitation argument because the predominance of small firms is a well-known feature of Hong Kong manufacturing sector (Sit 1985; Sit and Wong 1989; Liu and Wong 1992). The supplementary argument is straight-forward: small size implies a small capital base for in-house R&D, which in turn deters most firms from taking the "upgrade" route in the restructuring era.

Anomalous still, small firms can be so innovative as to constitute the growth engine to the "upgrade" route for a region, the "Third Italy" being a notable example (Best 1990). To fill the gap between efficient allocation of resources at the economy level and strategic orientation at the firm level, free-market advocates seek help from the rational-actor model to take relocation as an optimal strategy. Entrepreneurs in Hong Kong, whether they are called "merchant entrepreneurs" (Chau 1993) or "Kirznerian entrepreneurs" (Yu 1997), are typified to be non-specialists who adhere to a short-time horizon with little commitment to any business line. This is to say they are always ready to imitate products and make a quick shift to new business whenever opportunities emerge. With manufacturing flexibility and market responsiveness of this kind giving them an edge in international competition, Hong Kong entrepreneurs just prefer the "relocation" to the "upgrade" route.

To add all this up, free-market theorists make sense of Hong Kong's restructuring experience on the basis of the hypothetical working of a free market. Entrepreneurs' rational strategies constitute the effective working of a free economy, which in turn facilitates rational decision by entrepreneurs, the two reinforcing each

other as a virtuous cycle to keep Hong Kong in line with its comparative advantage. However, I find it more confusing than illuminating if we are to look into how the market works in the real world.

A Sociological Challenge to the Free-Market Thesis

While free-market advocates highlight Hong Kong's restructuring experience as a confirmation of the principle of comparative advantage, they neglect the power asymmetry among different players in the market. Underlying the principle of comparative advantage is the notion of free exchange, which takes the world as a whole to see whether resources are efficiently allocated. By assuming all parties are equal this notion obscures the existence of power in market exchange. Not only do nations differ in reality in access to information and resources, but market exchange per se can also be in theory a mechanism by which international inequality is sustained. After all, there may be a conflict between short-run allocative efficiency and long-run growth (Ho 1992). As in the case of manufacturing in general and the electronics industry in particular where a capability to upgrade is vital for sustainable development, a situation in which firms have difficulty upgrading their activities is hardly optimal, no matter how efficient they are at their existing form. To take the issue of international competition more seriously we need to switch from the notion of comparative advantage to competitive advantage. Only then we stand a chance in examining the power relationship among different actors in the exchange process, as for example, by identifying which party appropriates more economic rents.

To be fair, the free-market thesis is totally at ease with the notion of competitive advantage (see, for example, Enright et al. 1997 for such an analysis on Hong Kong). But as long as the rational-actor model remains a core proposition, the free-market

thesis can do no much better than simulating the market process in organizational vacuum. With all actors presumed rational and all strategic choice presumed optimal, a search for the logic of rational choice is prior to contextual understanding of economic life, leaving organizational process as a black box.

As Mark Granovetter (1985) cogently argues, inherent in economic theory is a conception of action and decisions carried out by atomized actors so that neither ongoing social relations nor wider structures are relevant (see also Swedberg 1997). Underlying this conception of the atomized actor is methodological individualism, which views collective political and economic behavior as an aggregate consequence of individual choice, with social structures originating from individual action. By overlooking the decision-making process, economic theory of this kind deprives us of what is most needed in order to judge whether a strategic choice is rational. As in our case, it is hardly convincing to say that "relocation" is more rational than "upgrading," except by a post-hoc deduction. Given industrial upgrading is a global trend, we can barely make sense of Hong Kong's peculiar preference for relocation over upgrading until we bring the situational and structural constraints facing these manufacturing firms into analysis. To account for the lack of industrial upgrading in the electronics field, this paper thus goes beyond the free-market thesis by applying a social-organizational approach instead.

IN SEARCH OF A SOCIAL-ORGANIZATIONAL APPROACH

Four decades ago, March and Simon (1958) had aptly argued against the unrealistic assumption of "perfect rationality" inherent in the rational-actor model. Instead, the two scholars assert that rationality can only be "subjective" or "relative" in the sense that any rational choice is made with a frame of reference which is itself determined

by the limitations of the rational man's knowledge. This is to say cognitive elements matter in decision-making such that people with different frames of reference will make different decisions even under an identical situation. The notion of "bounded rationality" thus rejects the "optimization" thesis of economic theory. Rather, organizations "satisfy". But the effectiveness justification for formal organizations still holds -- rules and routines are so designed as to minimize the kind of uncertainties associated with bounded rationality (Simon 1962).

If formal organizations are rationally designed as to achieve certain ends, we had better ask where those ends originate. It is thus very insightful that James Coleman (1993) pushes the social dimension to the center in organizational study, insisting that the organizational goal is contingent upon who runs the organization. Indeed, "the psychological properties of the persons involved in it, and their interests and social relations, must shape its properties" (ibid: 89). In other words, there is no such thing as an economic man; we make full sense of a formal organization only by taking it as a social organization in which interaction among different social actors shapes the way it formulates its organizational goal along with growth strategies.

Among various key actors, the founder is most often the one who defines the organizational goal, and the top management is the group who runs the firm. By figuring out the context in which the founder starts the firm together with the interactive process by which the top management coordinates daily operation, we can make more sense of firm strategies. Because business organizations in a given locality are situated in a very similar, if not identical, context – the so-called social-embeddedness of organizations, we make more sense of a collective strategy by looking into the set of structural constraints and growth possibilities available in that context. This paper therefore seeks to account for Hong Kong's peculiar upgrade

trajectory by uncovering the historical-institutional context in which the collective preference for relocation over upgrading prevails.

GCC Perspective: The World as a Hierarchy

A growing number of scholars who seek to account for economic transformation in East Asia are indeed working on a social-organizational approach that can link firm strategies with the global business environment and the local historical-institutional context (Chiu et al. 1997; Gereffi, 1995; Orru et al. 1997). Among them Gary Gereffi proposes the Global Commodity Chain (GCC) perspective (1994a; 1994b; 1995; see also Gereffi and Korzeniewicz 1994), which serves as a theoretical framework for interpreting the upgrade trajectory of a locality. Central to the GCC perspective is the concept of commodity chain, "a network of labor and production processes whose end result is a finished commodity" (Hopkins and Wallerstein 1986: 159). This network conception suggests we should no longer take developed and developing countries only as leaders and latecomers since these coordinated networks have spanned many countries to become global chains. Rather, a holistic view should hold that various localities constitute a single network of economic activities within which competition exists along with cooperation, and possibility along with constraint.

Despite adhering to the global framework, the GCC perspective intends to leave much room for concrete analysis of local dynamics because it "highlights the need to look not only at the geographical spread of transnational production arrangements, but also at their organization scope" (Gereffi 1994a: 219). By breaking down the global economic structure into an industry- or sector-specific analysis, the GCC perspective replaces the core-semiperiphery-periphery typology with a concrete analysis on varying ways in which different countries are connected to the global system. Two

distinct types of GCC are distinguished, namely producer-driven and buyer-driven GCCs. Producer-driven GCCs are those in which multinational manufacturers play the central role in coordinating production networks, typical examples being capital- and technology-intensive industries like automobile and aircraft. Buyer-driven GCCs are those industries in which large retailers, brand marketers and trading companies are vital in setting up decentralized production networks in a variety of exporting countries, typical examples being labor-intensive, consumer-good industries like consumer electronics and garment.

The notion of power asymmetry is well developed in the GCC perspective; GCCs are by nature governance structures, i.e. authority and power relationships that determine how financial, material and human resources are allocated and flow within the chain. In Gereffi's words, "whereas producer-driven commodity chains are controlled by core firms at the point of production, the main leverage in buyer-driven industries is exercised at the retail end of the chain" (1994a: 221-2). Simply put, in buyer-driven commodity chains most profits come from the marketing end, i.e. market research, design, sales, marketing and financial services, while in producer-driven commodity chains economic rents are retained in the production end through tight control over technology- and capital-intensive process. As a GCC is so hierarchically organized that core companies appropriate most economic rents by monopolizing those activities of the highest value-added, industrialization in a locality may merely mean an entrance to the lowest rank in a stratified network of economic activities. Therefore, the GCC perspective takes up industrial upgrading as a key issue by abandoning the production conception of development for an analysis on a much wider range of economic activities.

On the conceptual level, industrial upgrading in a locality can be viewed as a

shift from one node to another along the commodity chain that involves higher-value added activities. A list of these roles can be identified, namely 1) primary commodity exports; 2) export processing zone (EPZ); 3) original equipment manufacturer (OEM); 4) original design manufacturer (ODM); and 5) original branded manufacturer (OBM). Whereas industrialization involves a shift from role #1 to #2, industrial upgrading can be interpreted as a shift from role #2 through #5 as it implies a higher degree of competitive capability (Gereffi 1995). Table 1.1 elaborates with reference to buyer-driven GCC, in which the EPZ role just involves assembly – the lowest-rank task that adds least value across the chain. A switch from EPZ to OEM requires sophisticated manufacturing capability as well as full-fledge supply networks, whereas design expertise is the precondition for any transition from OEM to ODM. Upgrade to OBM is final because that means getting rid of buyer’s monopolization on the marketing end by selling under house brand.

Table 1.1. Upgrade in Activities by Role Shift in a Buyer-driven GCC

	Roles in a Buyer-driven GCC			
	EPZ	OEM	ODM	OBM
Activities	Assembly	Assembly; Packaging; Prototyping; Product Testing; Procurement; Shipment	Assembly; Packaging; Prototyping; Product Testing Procurement; Shipment; Product Design	Assembly; Packaging; Prototyping; Product Testing; Procurement; Shipment; Product Design; Distribution; Market Research; Brand Management

By highlighting the possibility of role shift in a stratified network, the GCC framework hints at an articulation between global restructuring and local upgrading. On one hand, major changes in the international political economy opening possibilities for developing countries to industrialize or upgrade (see, for examples,

Gereffi and Korzeniewicz 1994). On the other hand, the initial mode of insertion into the GCC exercises a path-dependent effect on a locality. With the restructuring era releasing the bottleneck between roles along a commodity chain, a certain number of junior partners can take the chance to shift to a higher-ranked role by strengthening its organizational competence. As Gereffi (1997) aptly puts it, "upgrading does not occur to a random set of high value-added industries or activities, but rather to the next links in the commodity chains in which countries are embedded" (p. 3).

But how does a locality become capable of realizing upgrade possibilities in the global restructuring? With the upgrade mechanism unspecified, we can never tell which locality would be more likely to shift to a higher-ranked role along a commodity chain. Worse, we produce no answer to the question of how a commodity chain as a governance structure remains stable over time. The puzzle is straightforward: a GCC will be highly unstable if upgrade is possible for all, provided any governance structure implies control from "core" corporations along with resistance from "periphery" firms. A supply-side argument at the firm level is therefore urgently needed if the GCC perspective is not to rely on a functional explanation, following in the footsteps of early world-system theory. This is why I seek help from organization theory to tackle two related questions: first, how the ongoing process at the local level contributes to the stability of a commodity chain; and second, what constitutes the capability for industrial upgrading in a locality.

Linking Local Dynamics to Global Continuity

The idea of "resource-dependency" -- an organization is always dependent on its environment for resources -- should help explain the stability of a commodity chain. As discussed in the previous section, a GCC constitutes a network in which dominant

overseas buyers (or producers) on the demand side determine what to produce by whom, and domestic manufacturers on the supply side in turn depend on these orders to continue their operation. In other words, overseas buyers (or producers) control the critical resources which domestic manufacturers must acquire to survive. According to Pfeffer and Salancik (1978; see also Salancik and Pfeffer 1977), a resource-dependence relationship has two important implications: first, control over critical resources provides external organizations with power over the focal organization; and second, those who manage to acquire those critical resources for the focal organization have more control over intra-organizational process. The concept of "external control of organization" may contribute to a detailed analysis on how inter-organizational process works across a GCC (cf. Lai 1998). However, my paper would rather take "power in organization" as a starting point for making a linkage between global continuity and local dynamics.

The resource-dependence perspective offers a useful framework for organizational analysis, especially on the lateral dimension of power, i.e. power among functional departments (Boeker 1989; see also Perrow 1970; Fligstein 1990). As regard to the question of who gets power in an organization, the resource-dependence perspective suggests that it should be those subunits most capable of furnishing critical resources. While this seems common sense, Salancik and Pfeffer (1977) added that those who get power can hold onto it once they come into power, because "in organizations there are obviously opportunities for defining certain activities as more critical than others" (p.9). Therefore, those subunits may enhance their own survival through control over critical resources, placement of allies in key positions, and definition of organizational problems and policies in line with their interest, capability and belief. This is to say subunit interests may become

institutionalized in an organization such that subsequent structural inertia may deter the organization from adapting to environmental change.

But as just mentioned, what constitutes the critical task for an organization is not so much a technical problem, but is rather subject to definition by power holders. Then we should ask who comes to power in the first place and how do they define what problems the organization has to tackle. Yet Boeker (1989) insightfully points out that the resource-dependence perspective often inclines towards studying conditions currently faced by the organization, largely overlooking the historical dimension in general and entrepreneur influences at founding in particular. Hence he highlights the founder's past experience in influencing the form of the organization s/he creates:

"It is likely that founding entrepreneurs will structure their organizations according to their own past experiences and beliefs. The founder's past experience will help shape how he or she feels about the relative importance of specific functions to the organization" (p.392).

Here we come to a path-dependence argument that helps explain how an industrial firm may be trapped in a particular, sometimes sub-optimal, organizational form. When an entrepreneur starts a new firm, s/he organizes it in a way s/he *believes* would best achieve those critical tasks, thus setting an organizational form around which the firm evolves later on. Functional staffs whom the founder considers most capable of fulfilling those tasks gain power from the outset, and subsequently stand a chance in extending their dominance in the organization by controlling information flow, designing co-ordination routines, defining growth possibilities and/or formulating development strategies. As long as acceptable results are achieved, the entrepreneur (and the top management) is likely to take the existing mode of operation for granted. With problems defined and solutions sought on the basis of this existing

mode, the organization is set towards a path-dependent development.

This path-dependent argument explains how dynamics in local organizations act as a stabilizing element in a GCC. In the case of buyer-driven GCC, an entrepreneur who starts a firm to serve as OEM is likely to regard dealing with overseas buyers as the most critical organizational task. Those who monopolize this function -- sales and marketing staffs in most cases -- may turn out to have more control over the decision-making process. From then on the firm revolves around an organizational form in which the sales/marketing department has more power than other functional departments in directing strategic development. As long as sales/marketing staffs remain keen on spotting business opportunities in the OEM marketplace, the firm has its organizational capability built around the need of its buyers. As a result of its attachment to the OEM role, the firm becomes handicapped in switching to other roles even when upgrade opportunities are available. After all, the stability of GCC is made possible only by the self-confinement of local suppliers to a narrow scope of activities.

Social Selection of Organizational Model

By discussing how structural inertia locks a firm in a path-dependent development, I do not mean to preclude the possibility of organizational transformation. But should this happen, a *perceived* crisis is the precondition for the firm to re-conceptualize those taken-for-granted ways of doing business (Fligstein 1990; see also Grove 1996). With structural inertia very likely to last for years, if not decades, in most industrial organizations, a study on how an organizational form emerges and prevails in an industrial field should help figure out the upgrade capability in a locality.

Of much relevance here is the institutional approach whose primary emphasis is

on unpacking how organizations are embedded in the institutional context (Orru et al. 1997; Scott 1995; Whitney 1992; Zysman 1994;). Inherent in this approach is a contention that the wider institutional setting constrains the way firms organize, and in turn gives rise to a prevalent organizational form that shapes the economic performance of a locality. A handful of empirical studies deserve a bit more discussion here. In a comparative study on France and Germany, Maurice et al. (1986) articulates how national institutions -- the education domain, the business organizational domain and the industrial relation domain -- vary to shape the way industrial firms organize production and manage work relations in each nation. Likewise, Orru et al. (1991) demonstrate that business organizations in Japan, South Korea and Taiwan are structurally similar within each society but are strikingly different across societies. In essence, this study argues that the three Asian societies each has a distinctive context of fiscal, political and social institutions that limits and directs the development of business organizations, resulting in organizational isomorphism towards the fittest form within each society.

While these scholars, among others, examine why an organizational form prevails in a given society, some others pay more attention to how the prevalent form shapes industrial performance in a locality. Saxenian (1994) sets an example in investigating why the Silicon Valley outperforms Route 128 in the US high-tech industries with reference to variations in regional institutions and corporate forms. Simply put, a network-based collaboration of small firms in the Silicon Valley promotes collective learning, flexible adjustment and continuous innovation, while the independent working of vertically-integrated large firms in Route 128 turns out to be too rigid to make adjustment in the increasingly fast-changing market.

Reinstating Organizational Ecology

Linking local institutional environment with organizational performance does constitute a useful framework for further studies on industrial competitiveness, but the danger is that we overlook the persistence of qualitatively different organizational forms in a locality (or even an industry) when we seek to explain only homogenization. On one hand, the homogenization thesis ignores the inertial force in individual organizations (Hannan and Freeman 1977 & 1984). On the other hand, we risk adhering to a conception of social actors that is too static, constrained and over-socialized to understand how institutional change is activated (Powell 1991; see also Hirsch 1997; Stinchcombe 1997). Consider the case of Hong Kong where an institutional configuration of an organizational model that fails to upgrade has been identified (Chiu et al. 1997). This homogenization thesis implies that Hong Kong stands no chance in industrial upgrading, overlooking the persistence of some other firms that are organized in qualitatively different forms but perform better in industrial upgrading. Worse still, we put ourselves in "bad-faith" when Hong Kong seems destined to underachieve in industrial upgrading (see Berger 1963 for "bad faith").

As Walter Powell (1991) aptly advocates, a more productive approach would take both homogenization and variation into consideration, i.e. to take the competitive nature among different organizational forms as a point of departure. Here I find the imagery of organizational ecology useful by conceptualizing an industry as a field where we can identify a handful of qualitatively different organizational forms, each built upon a distinctive growth orientation (Barnett and Carroll 1993). The thesis that only one dominant organizational form prevails in a field still holds, but not so much as the result of transformation and imitation by existing organizations. Rather, it is the

consequence of more organizations succeed and fewer fail in that particular form than is the case for alternative forms -- selection rather than adaptation (Hannan and Carroll 1995).

To clarify why such competing organizational forms usually co-exist without turning into manifest conflict in the field or society level, a distinction between "institutionalization as an outcome" and "institutionalization as a process" by DiMaggio (1988) should help:

"Institutionalization as an outcome places organizational structures and practices beyond the reach of interest and politics. By contrast, institutionalization as a process is profoundly political and reflects the relative power of organized interests and the actors who mobilize around them" (p. 13).

This is to say competition of this kind is usually latent because firms are often embedded in a historically specific institutional context where one organizational form has already gained legitimacy -- institutionalization as an outcome. That particular form benefits from an affinity with the local institutional framework, as well as greater power to mobilize institutional support than other competing forms. Its prevalence is therefore likely to continue, or even be speeded up by imitative behaviors of new entrants. But other organizational forms may persist, albeit in a marginal status, because there are always some actors who uphold different business orientations.

The notion of "institutionalization as a process" sheds light on the issue of how an organizational form gets legitimated by crowding out other competing forms. Hence an appropriate research strategy is to trace the natural history to see the rise and fall of different organizational forms. Two empirical works exemplify such an attempt. First, Piore and Sabel (1984) demonstrate how institutions in US evolved around the mass-production paradigm to preclude its craft-production opponent

throughout the 20th century until the early 1980s. Second, Fligstein (1990) examines how the interplay among managers, firms and the state altered the "conceptions of control" from one type to another that transformed the US corporate sector over the past two centuries. In essence, these two seminal works uphold that "institutionalization as a process" activates only in "turning points", i.e. when the industry gets started or when the take-for-granted way of doing business is in crisis.

A Sociological Account on Industrial Transformation

To summarize, I suggest looking into the evolution of an organizational field, which serves as a meso-level analysis that bridges the gap between the global level on one hand and the firm level on the other. To make sense of the upgrade trajectory of a locality, we should examine how an organizational form comes to dominate an industrial field in the first place, and how it sets the direction and pace for industrial development thereafter. To figure out how an organizational form prevails in an industrial field, we should first of all turn to a historical analysis that puts entrepreneurs into context by outlining the set of structural constraints and business opportunities available in the industrial field since its very inception. Because competition among different business orientations is the most manifest at this stage, we can identify different organizational forms by examining the variety of these orientations in the field (Fligstein 1990).

The business orientation of each firm is often manifested in its choice of growth strategies during its formation years (see, for examples, Boeker 1989 and Grove 1996). Among various orientations that may be found in an industrial field, I construct three ideal types with reference to the three functions that are key to any industrial firm (Perrow 1970), as listed in Table 1.2. First of all, the "research orientation" upholds

constant research and ceaseless innovation, advocating research-driven strategies like basic research, product development and/or technology application as the best growth strategy. Adherents are likely to be those who come from the "technology domain," as for examples, those with formal training in engineering or science disciplines, and/or those with a technical background. Second, the "sales orientation" advocates getting more products and/or services sold, embracing sales-led strategies like market diversification, product differentiation, etc. Adherents are likely to come from the "market domain" such as those with sales and marketing experience and/or those from a trading background. Third, the "production orientation" aims to get the production more efficient and less costly, upholding such production-centered strategies as automation, vertical integration and/or industrial engineering. Adherents are likely to come from the "production domain", as for examples, former craftsmen, industrial engineers and factory managers.

Table 1.2: The Three Ideal Types of Business Orientations in the Industrial Field

	Business Orientation	Potential Advocates	The Strategic Inclination
Research Orientation	Constant research and ceaseless innovation	Adherents to the technology domain, likely to include those who are trained in engineering, science and/or other technical disciplines	Evolves around research activities including basic research, technology application and product development
Sales Orientation	Getting more products and/or services sold	Adherents to the market domain, likely to be those with sales and marketing experience and/or those from a trading background	Intends to increase sales by product differentiation, market diversification and the likes.
Production Orientation	Getting the production more efficient and less costly	Adherents to the production domain, likely to include those closely involved in the production function, e.g. industrial engineers, craftsmen and production managers	Aims at streamlining the production, as for examples, by automation, industrial engineering and vertical integration.

Source: see text

Legacy matters in the competition. With global restructuring during the post-war era opening new opportunities for many a locality to develop their economic activities, it is the local response that sets up its own industrial field. After all, the pre-existing socio-economic setting in a specific locality is often organized around some economic activities at the expense of others, delimiting the range of possible roles it can take up in the international division of labor. As a result of the mode of insertion into the global economy, local people from different functional backgrounds (thus with different orientations and capabilities) have different chances in setting up an industrial firm, and industrial firms with different business strategies have different chances in seizing these growth opportunities. Those who are better posited to seize these growth opportunities are more likely to prosper, and subsequently gain a majority status by spreading their business strategies across the field.

Also beyond the reach of any individual actor is the institutional context where resources necessary for organizational building are available. Of greater relevance is a set of critical institutions -- the so-called proximate institutions -- which directly enables and constrains firms to structure their organizations and formulate their strategies. This institutional context comprises the state support system for industry, the financial system, the labor market arrangement and the education system (Whitley 1992; Zysman 1994; Chiu et al. 1997). Adherents to different business orientations require quite different sets of resources to flourish, as for examples, the research orientation requires abundant supply of engineering and technology experts, and the production orientation needs craftsmen and technicians. By offering a set of critical resources, the institutional context in effect controls the chance of survival among different organizational forms.

Under a historically specific institutional context all three organizational forms

may profit (note that I am saying organizational forms but not organizations), but they are deemed to have different rates of success and failure. Hence the industrial field evolves in a way that one organizational form eventually prevails in both terms of absolute number and relative size, paralleled by the approval of its way of doing business by the wider society. Alternatives may persist, despite becoming less likely than the dominant one to benefit from institutional support. From then on "institutionalization as a process" pauses, leaving the dominant form to take charge in the field until another turning point.

HONG KONG ELECTRONICS REVISITED

It is my major contention that there persists an organizational form in the electronics field -- the sales-led form, whose contribution to Hong Kong's early success in international subcontracting also constitutes its later failure in industrial upgrading. The electronics industry has a long history in Hong Kong dating back to the late 1950s, making it one of the oldest around the region. Its early success is well documented, with the drastic growth in the 1970s demonstrating its excellence in international subcontracting. But its eroding competitiveness is nonetheless shown by a sharp decline of local production since the mid-80s. However, the vast majority of local industrial entrepreneurs still stuck with the subcontractor role even when they have enlarged their scale after relocation:

"Hong Kong electronics industry manufactures mature products for OEM markets when prices have eroded to a point where the original manufacturers can no longer make an acceptable profit margin. Since Hong Kong companies can quickly ramp up lower cost manufacturing of these products, they can enjoy higher profit margin. Though continuous improvement of their manufacturing techniques Hong Kong companies can significantly extend the time over which an acceptable profit margin can be achieved. After the product price erode beyond an acceptable profit margin the company finds new mature products to begin the cycle again" (Reif and Sodini 1997: 188).

By developing an account on the persistence of these sales-led subcontractors over decades we understand why Hong Kong took such a radically different path to industrial upgrading from the other NIEs.

Data and Method

In line with my intention to link firm strategies with the global business environment and the local institutional context, this thesis is built upon data at various levels. First, I map out the upgrade trajectory of various electronics sectors in Hong Kong by making use of government statistics on industrial production and domestic exports over the past two decades. Second, to uncover the organizational ecology where we see the rise and fall of different organizational forms, I trace the growth trajectory of practically all listed electronics firms on HKSE by examining their IPO documents and annual reports. Third, to grasp the organizational process I conducted personal interviews with key executives of six local firms selected on a theory-driven basis. This historical study also draws on references ranging from academic studies to government-sponsored consultant reports, business journals and newspaper reports.

To start with, this thesis arrives at a detailed assessment on the upgrading performance of the Hong Kong electronics industry over the past two decades by re-categorizing government statistics into a finer grouping of product segments. As for statistics published in *Survey of Industrial Production* (Hong Kong Census and Statistics Department 1978-96), four-digit product groupings -- the finest grouping as published -- are classified into five categories to facilitate sector analysis, namely, consumer electronics, parts and components, computer products, office automation equipment and others. As for statistics published in *Hong Kong Trade Statistics* (Hong Kong Census and Statistics Department 1978-1996), the finest groupings as

published -- five- or six-digit depending on years of publication -- are classified into three product categories, namely, audio-visual products, computer products and semiconductor devices. By classifying the production and export statistics into meaningful product segments, this thesis provides strong evidence for showing the pattern of industrial upgrading in the electronics field over the past two decades (further details on product classification schemes are provided in relevant tables and figures).

Central to the understanding of the industry's peculiar upgrading pattern is the evolution -- both homogenization and variation -- in the organizational field. In an ideal world, either drawing on publicly available statistics or doing a survey would be find. But in fact, not only does the Hong Kong government maintain a rather narrow scope of industrial statistics, but Hong Kong industrialists never seem comfortable with responding to survey research, especially when the questionnaire is long. To make ends meet I trace the growth trajectory of practically all publicly-listed electronics firms on the basis of qualitative data that include IPO (initial public offering) documents, annual reports, newspaper reports and/or articles in books and journals. To categorize these firms into a meaningful typology, each case is coded according to variables such as founder background, business claim, business orientation, top management formation and competitive performance (see Appendix 1 for details on the coding scheme, the typology and data on each firm). The data set includes a total of 53 home-grown companies, deliberately leaving out those with a foreign origin and those entering the electronics field through merger.

Though the data set covers only a relatively small portion of the organizational field, it is an effective way to assess the likelihood of success and failure of different organizational forms in the electronics field as a whole. Not only does it uncover the

persistence of qualitatively different organizational forms in the field, but it also makes a perfect control over the size effect on corporate success. As all companies in the data set have grown from a relatively humble to a well-established scale in their course to public listing, the convergence of organizational features among these firms, if found, indicates which organizational form is the most likely to lead to corporate success in the field. To fill the gap between this 53-firm data set and the 800-strong electronics field, this study draws on various secondary sources ranging from academic studies to government-sponsored consultant reports, business journals and newspaper reports. After all, the data set is used to illustrate the organizational field and its evolution over the years, not to represent it.

Last but not least, I conduct in-depth interviews with key executives of six electronics firms in order to make more sense of firm strategies (see Appendix 2 for the interview schedule). With the six firms each selected on a theory-driven basis, interview data shed light on how organizational structure and dynamics vary to lead to diverse upgrade trajectories among Hong Kong electronics firms. For a small number of cases are covered, I never mean to generalize a pattern from interview data. Instead, these cases are only used to make sense of the pattern we have identified through other data sources. After all, interview data not only help illustrate how subcontractors get locked into labor-intensive manufacturing, but also show how a few local firms excel as a frontrunner in certain market niches largely as a result of their distinct organizational forms.

Chapter Organization

From looking into the formation of the local electronics field through the 1960s to 1970s we contextualize the emergence of sales-led subcontractors. The legacy as a trading port paves the way for Hong Kong's early integration with the global

economy through a closely-knit commercial network. Its manufacturing sector, the electronics industry being no exception, has from the very beginning been connected to the global economy through overseas buyers. Chapter 2 maps out its upgrade trajectory with reference to its decade-long subcontractor role in the international division of labor. In line with its preoccupation with international subcontracting, market responsiveness and manufacturing flexibility, rather than constant product development and technological innovation, always constitute the thrust of development in the industry. Though we do see limited product upgrade over the last three decades, Hong Kong has stagnated as a player at the lower end of the market even after upgrade opportunities became more abundant in the restructuring era.

But if the preoccupation with international subcontracting is associated with the lack of industrial upgrading, we had better figure out the mechanism by which local subcontractors get locked into labor-intensive OEM. Chapter 3 uncovers the local dynamics that makes Hong Kong stagnate in the international division of labor. Suffice it to say here, its insertion into the buyer-driven GCC favors those who monopolize business contacts with overseas buyers to start up an industrial firm – most likely to be executives with trading background and/or sales experience. During the early phase of industrialization, the sales orientation is thus likely to prevail in the field, and even be speeded up later by spin-off. With sales-led subcontractors outnumbering competing organizational forms, the subcontractor orientation governs the industrial field as a whole. With the vast majority organizing around the sales-led subcontractor form, the electronics field falls into the vicious cycle of working in the OEM system, standing little chance in moving away from labor-intensive manufacturing.

Chapter 4 turns to examine why these sales-led subcontractors have been so

predominant in the organizational field for so long. After all, the local institutional context plays a key role in sustaining the status quo, favoring sales-led subcontractors even after the restructuring era in which alternative organizational forms are better equipped to capitalize on upgrade opportunities. With the overall institutional environment less supportive to the industrial sector than the commercial, real estate and financial sectors, there has never been a strong stimulus for systemic transformation in the industrial field. In the case of proximate institutions, sales-led subcontractors can even take advantage of their majority status to become the primary beneficiary. As a result, alternative organizational forms remain so marginal in Hong Kong that the electronics field lacks a critical mass to alter its upgrade trajectory over the past two decades.

My thesis is somewhat contrary to the popular belief that Hong Kong is a free market wherein efficient allocation of resources at the economy level always go hand in hand with rational choice of business strategies at the firm level. In the concluding chapter I will reaffirm my stance by showing how the dominant model undermines sustainable growth even at the firm level. Along with evidences contrary to the free-market thesis, the social-organizational approach prevails by virtue of a concrete micro-macro linkage.

CHAPTER TWO

HONG KONG AS A FOLLOWER IN THE REAR

THE ELECTRONICS INDUSTRY IN RETROSPECT

The colonial and trading legacy gave the Hong Kong electronics industry a first-mover advantage during the era of the New International Division of Labor (NIDL), connecting it to the global economy through international subcontracting and, to a lesser extent, foreign direct investment (FDI). Ironically, its early insertion into the global economy is only followed by its stagnation as a cost-based competitor in the OEM marketplace for decades. To look back, the industry never took advantage of its earlier lead to catch up with the regional race by moving towards high value-added activities but only excelled in the OEM role by flexibly responding to whatever expansion room emerged on the low-end market. While product upgrade of limited scale is recorded time and again over the past two decades, neither process innovation nor technology catch-up has gone far enough to alter its status as a follower in the rear. Even after massive relocation has multiplied its overall scale in the 1990s, Hong Kong electronics industry still sticks to labor-intensive manufacturing (Chiu et al. 1997).

Early Integration with the Global Economy

Quite a number of scholars attribute Hong Kong's early industrialization to its trading port legacy (see, for examples, Chiu et al. 1995 & 1997; Henderson 1989; Lin and Ho 1980; Sit and Wong 1989). The period of colonial development as a trading port has at least two major influences on Hong Kong's post-war industrialization. First, local merchants were allowed to grow alongside with British ones to perform an intermediary role between Hong Kong and the West. The presence of these merchants and their extensive business networks in turn constituted a solid foundation for later

industrial development. In addition, the entrepot trade bequeathed Hong Kong with transport and communication facilities, as well as the relatively efficient and stable administrative machinery. These combined to give Hong Kong an apparent advantage in connecting to the global economy. Therefore, migrant entrepreneurs from Shanghai did not take long to establish a dynamic export-oriented textile industry in Hong Kong when international trade became more liberal, multilateral and interdependent in the post-war era. Likewise, when firms in advanced countries searched for low-cost production sites around the world in the 1960s, Hong Kong moved even faster than Singapore to seize that golden opportunity to establish its export industry (Chiu et al. 1995).

The electronics industry emerged rather late in Hong Kong relative to the textile one, starting only after the era of NIDL (Henderson 1989). Yet the former British colony did lead the region in attracting FDI. A small number of Japanese producers already entered Hong Kong in the late 1950s to assemble transistor radios, and by the mid-60s, almost every large US consumer good and semiconductor manufacturers had established operations in Hong Kong (Hobday 1995). But the prosperity of Hong Kong electronics industry has less to do with FDI than the rise of local firms. Despite a drastic expansion in the 1960s -- the number of establishments increased from only four in 1960 to 230 in 1970 -- the industry only emerged to be a significant contributor to Hong Kong economy after the 1970s, a decade in which the number of establishment increased by more than five times from 230 to 1,316, and the value of domestic exports by more than twelve times from HK\$1,074 million to HK\$13,417 million (Hong Kong Industry Department 1996). From the mid-70s onwards the surge of local firms into a wider product range has constituted the primary source of production and employment in the industry (Hong Kong Productivity Centre 1983).

In the meantime, the relative share of MNCs in total exports fell from 93.4% in 1970 to 37.6% in 1981, and their share in total employment, from 77.8% in 1970 to 27% in 1981 (ibid: 17). All in all, local firms have been driving the development of Hong Kong electronics industry over the past two decades.

But a global force lay behind the local scene; the dramatic growth in this earlier phase just shows another fast absorption of Hong Kong by the NIDL. Indeed, Gregory (1985) attributes that the rapid growth of local production as the achievement of a working alliance developed between local entrepreneurs and large mass merchandisers in major North American and European markets. Likewise, the Hong Kong Productivity Centre (1983) noticed by the early 80s that the remarkable growth in the 70s had very much to do with the successful implementation of a set of strategies oriented towards overseas buyers for consumer electronics:

"The existing Hong Kong electronics industry has grown and prospered through a pattern that has evolved over the years. With few exceptions, the industry has been based on offering competitively priced private label goods typically assembled from imported components. The main attribute of the Hong Kong electronics industry is its ability to deliver styling and product changes in time to meet buyer demands in the fad segment of consumer electronic products" (Foreword).

This is to say, the electronics just followed most other manufacturing industries in Hong Kong to get connected to the global economy primarily through international networks of commercial subcontracting (Berger and Lester 1997; Chiu et al. 1997; Epsy 1970; Sit and Wong 1989; Yu 1997). Hong Kong's pioneer status in international subcontracting is indeed demonstrated by the fact that the territory's first electronics company -- Champagne Engineering Corporation -- started to assemble transistor radios for Sony of Japan in 1959 (Chen 1971). From then on most local firms just prospered through participating in a form of international subcontracting arrangement in which

they produce according to the requirements of orders/contracts received from international sourcing agents (Hobday 1995). To use Gary Gereffi's terms, Hong Kong electronics industry has been linked up to the global economy by taking up the OEM role in buyer-driven GCC.

Growth without Catch-up

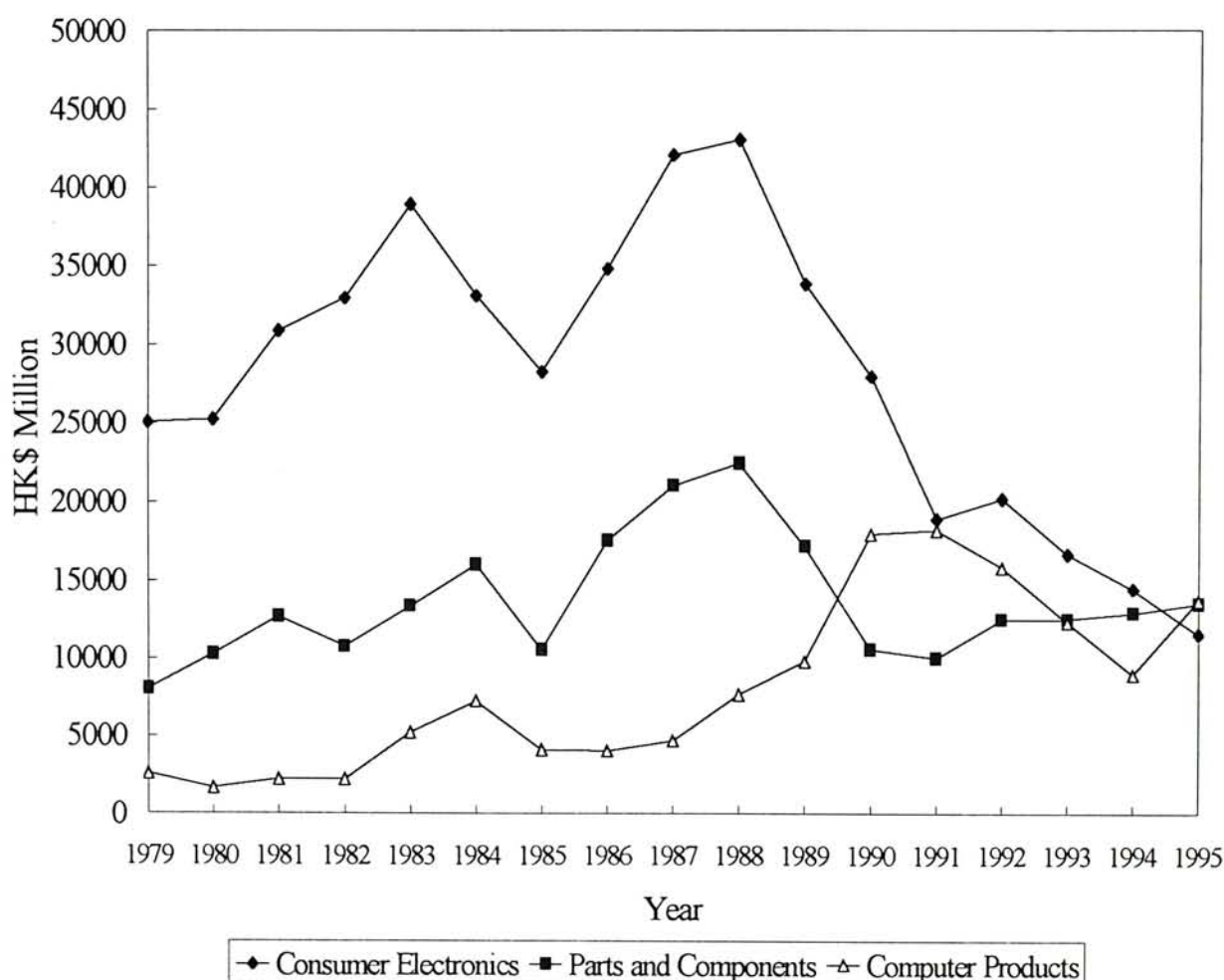
But while the fast success in the OEM marketplace did bring Hong Kong a dynamic electronics industry, it did nothing to strengthen Hong Kong's competitive performance in the regional race. Instead, the growth paralleled a transformation of industrial structure towards consumer products in general and fad products in particular, pointing to the failure of Hong Kong electronics industry in moving towards high value-added activities. Due to the predominance of labor-intensive activities, local production had lost its momentum not long after costs stood higher than neighboring regions in the 80s.

By the early 80s Hong Kong electronics industry was found to be oriented towards consumers electronics, a direction opposite to that of Japan, South Korea, Taiwan and Singapore, among others, where high value-added sectors like computer, office automation and industrial electronics had then been major growth areas (Hong Kong Productivity Centre 1983). In fact, the share of consumer products in Hong Kong electronics exports increased sharply from 52% in 1974 to 71% in 1980, and that of parts and components decreased from 48% to 29% over the period (ibid:13-4).

The trend persisted to make consumer electronics a consistent leader among all electronics sectors. As shown in Figure 2.1, consumer electronics constituted over 50% of the industry's gross output throughout the 80s, followed by parts and components,

with computer products comparatively insignificant in that regard⁴. Not until consumer electronics showed a sharp decline since 1988 did the other two sectors catch up slowly. But in terms of number of firms, consumer electronics has not been challenged ever since the late 1970s, as Table 2.1 shows that the sector often exceeded, and sometimes was even double or triple, the sum of all other sectors in the 1979-95 period.

Figure 2.1: Gross Output of Major Sectors in Hong Kong Electronics Industry at 1990's Constant Price, 1979-95.



Note: The constant price is calculated by deflating the nominal price by the volume index as listed in Hong Kong Census and Statistics Department (1998) *Estimates of Gross Domestic Product*.

Source: Hong Kong Census and Statistics Department, *Survey of Industrial Production*.

⁴ Hong Kong Census and Statistics Department does not use such categories as I use in this chapter. To facilitate sector analysis, *Consumer Electronics* includes “electronic toys,” “electronic watches and clocks,” “transistor radios,” “television receivers and communication equipment,” “sound reproducing & recording equipment and apparatus”; *Parts and Components* include “electronics parts and components,” *Computer Products* include “computing machinery and equipment”; *Office Automation Equipment* includes “office machinery and equipment except computing and accounting machinery,” and *Others* include those electronics products not elsewhere specified.

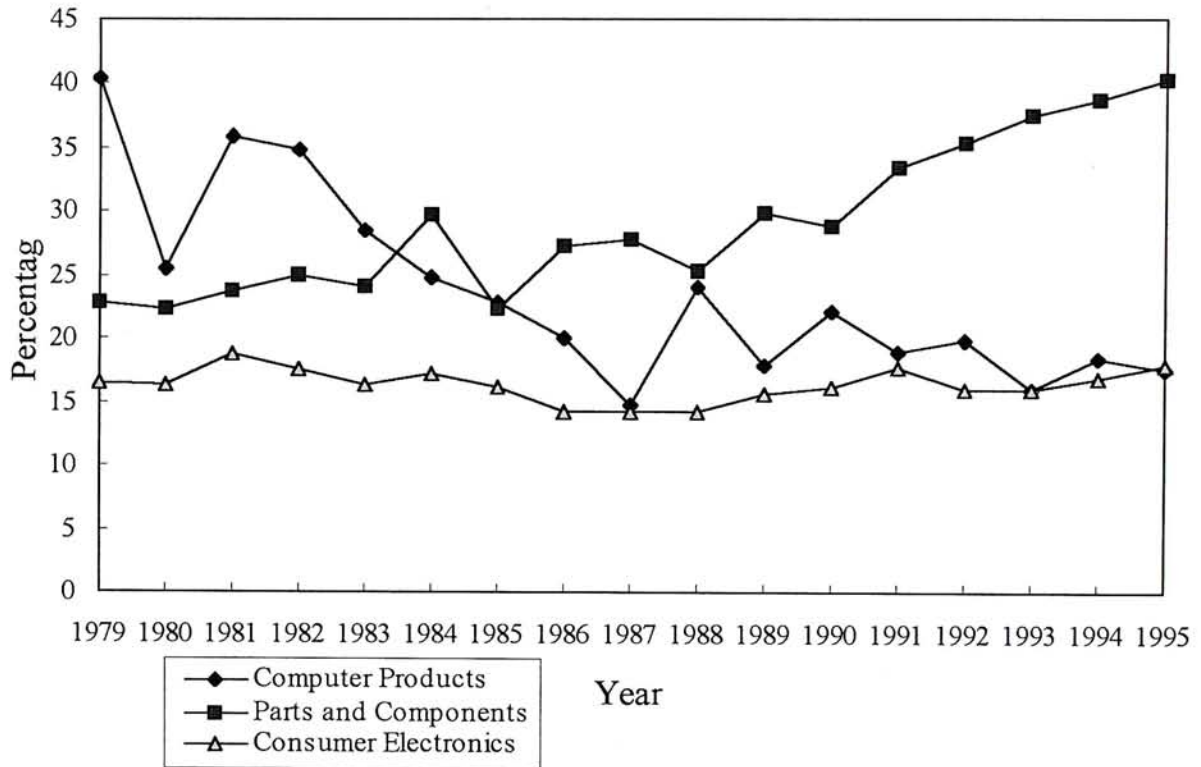
But the predominance of consumer electronics did not coincide with a better competitive performance. Quite the opposite, the sector has consistently been weaker than the computer and component sectors in value-added ability, measured by value-added as a percentage of gross output (Figure 2.2). This explains why the Hong Kong Productivity Centre (1983) discovers a plunge in value-added per unit sale in the electronics industry during its fast growth in the 1970s, with the figure falling to around 25% of the output value in 1980 from an average of 30% between 1973 to 1977 (ibid.: 11-2). A much steeper drop in consumer electronics in the late 80s in both gross output (Figure 2.1) and number of firms (Table 2.1) further confirm its relative weakness. By contrast, the component and computer sectors, both of which include comparatively higher value-added activities, recorded steadier employment during the 80s; the computer sector even showed an increase in number of firms.

Table 2.1: The Scale of Major Sectors of Hong Kong Electronics Industry, 1979-95.

Year	Consumer Electronics		Parts and Components		Computer Products		Office Automation Equipment		Industrial Apparatus		Others	
	No. of Firms	No. of persons engaged	No. of Firms	No. of persons engaged	No. of Firms	No. of persons engaged	No. of Firms	No. of persons engaged	No. of Firms	No. of persons engaged	No. of Firms	No. of persons engaged
1979	757	N/A	153	N/A	42	N/A	3	N/A	2	N/A	90	N/A
1980	956	N/A	348	N/A	16	N/A	4	N/A	11	N/A	83	N/A
1981	1442	N/A	347	N/A	13	N/A	21	N/A	12	N/A	98	N/A
1982	1267	N/A	394	N/A	21	N/A	8	N/A	16	N/A	95	N/A
1983	1524	80869	456	29788	40	10517	17	208	19	523	161	2684
1984	1575	76493	469	32969	99	14841	17	283	28	605	91	4222
1985	1295	60177	326	30218	133	11936	12	175	4	519	189	8538
1986	1217	56397	515	35793	97	8691	26	1007	101	435	227	6971
1987	1032	57835	561	37718	74	8142	26	1270	24	421	273	7598
1988	943	48938	533	38566	111	14524	41	2262	53	386	223	6786
1989	912	42596	508	35440	101	13810	24	1584	14	163	221	5652
1990	733	33200	372	24363	213	21495	20	2050	52	324	112	3613
1991	677	22782	313	22638	158	16431	40	2228	33	357	64	2074
1992	677	19235	313	22695	158	12146	40	2051	33	174	64	1647
1993	434	15825	242	21994	105	10790	53	2593	19	162	38	1199
1994	403	12270	175	19539	119	9280	52	3520	17	179	40	1136
1995	405	9277	173	18421	123	9437	63	3448	18	137	25	653

Source: Hong Kong Census and Statistics Department, *Survey of Industrial Production*.

Figure 2.2: Value Added as a Percentage of Gross Output in Major Sectors of Hong Kong Electronics Industry, 1979-95.

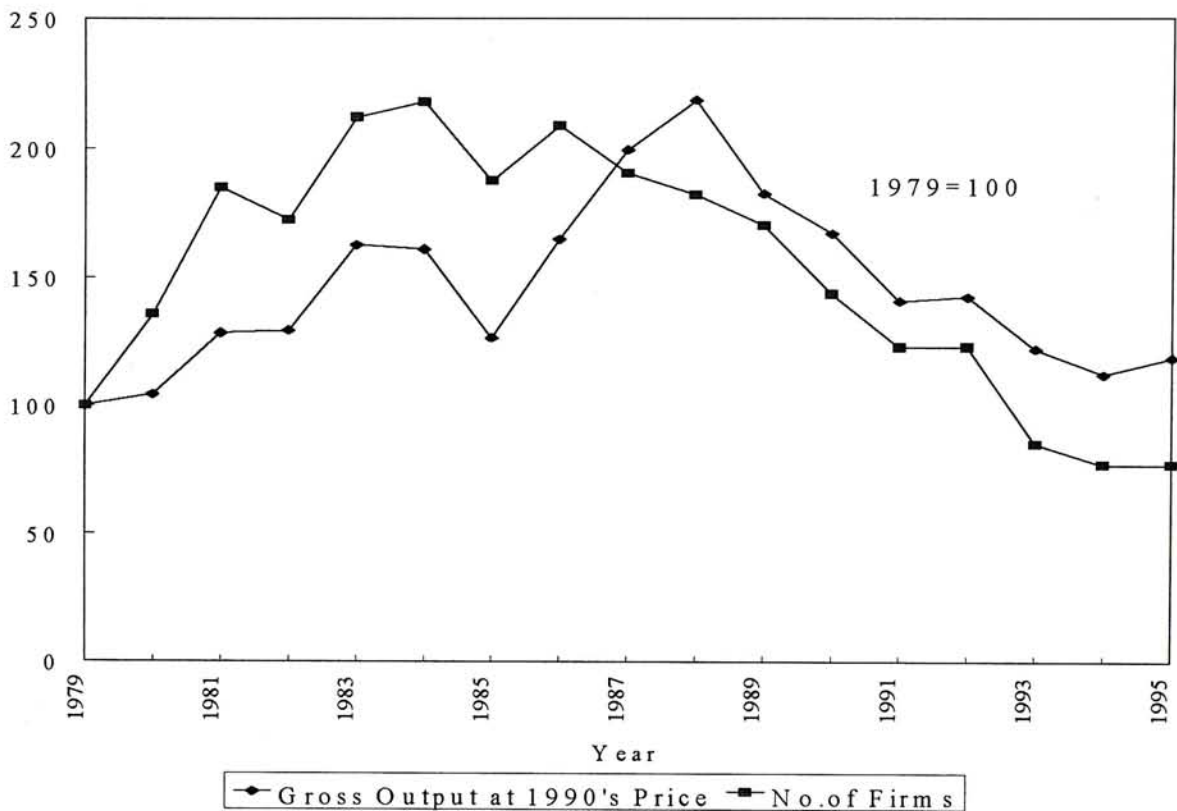


Source: Hong Kong Census and Statistics Department, *Survey of Industrial Production*

Despite outperforming consumer electronics, both the component and computer sectors have yet to claim a satisfactory competitive performance by international standards. The fact that the local electronics industry has long relied heavily upon imported parts and components points to the weakness of the component sector. With critical components often imported from Japan, Taiwan, South Korea, US and Europe, less than half of the total purchased materials are composed of locally available parts (Dataquest Inc. 1991: IV-9). Likewise, the computer sector remains a junior partner in international trade, as a recent government-sponsored consultant report on Hong Kong electronics industry found (Boston Consulting Group 1995):

'The majority of establishments in the Computers & Peripherals sector in Hong Kong assemble products from the key component level and do not themselves hold any significant proprietary technologies. The products manufactured in Hong Kong are usually "mature" (i.e. essentially commodities) or in the consolidation stage, with the Hong Kong companies generally belonging to the lower tier group of competitors who compete on a cost basis' (p.80-1).

Figure 2.3: The Growth Trend of Hong Kong Electronics Industry, 1979-95.



Note: The constant price is calculated by deflating the nominal price by the volume index as listed in Hong Kong Census and Statistics Department (1998) *Estimates of Gross Domestic Product*.
 Source: Hong Kong Census and Statistics Department, *Survey of Industrial Production*

After all, the electronics industry as a whole failed to upgrade production as well as to catch up with its competitors throughout the 1980s. Squeezed by intensifying competition on the one hand and surging local costs on the other, the industry faced a downturn from the mid-80s onwards (Figure 2.3). A look at Figure 2.1 confirms that consumer electronics took the lead in the downturn, but statistics from Table 2.1 shows that both computer and component sectors did little more than postpone the decline of local production. Therefore, the late 80s through early 90s saw a sharp decline in both gross output and number of firms (Figure 2.3).

Entering the Made-by-Hong-Kong Era

The sharp decline throughout the last decade in a way reflects Hong Kong's failure in catching up with South Korea, Taiwan and Singapore on the one hand, and the

intensifying competition from Thailand and Malaysia on the other (Dataquest Inc. 1991; Boston Consulting Group 1995). But most of all, the decline of local production is resulted from a collective strategy in the industry -- production relocation in Mainland China -- in face of a surge in local production costs since mid-80s. With most firms taking the relocation route instead of the upgrade alternative, offshore production has multiplied at the expense of local production in the 90s, marking the era of "made by Hong Kong" (Berger and Lester 1997).

A study on industrial investments in the Pearl River Delta conducted by the Federation of Hong Kong Industries confirms the trend of relocation (Federation of Hong Kong Industries, Industry & Research Division 1992). Almost 70% (69.4%) of the electronics establishments covered by the study have investment in the region (ibid: 63), with the average employment size of these relocated establishments being 905 persons (ibid: 69). In terms of investment, electronics firms in the Pearl River Delta tend to concentrate in two clusters (ibid: 67). At the one end, there are small and medium-sized firms with capital size of less than HK\$5 million (39.2%). And at the other, there are larger firms with capital size more than HK\$20 million (20.8%). These findings indicate that the strategy of going offshore is by no means confined to larger firms. Given the geographical proximity between Hong Kong and the southern China, many small and medium-sized firms can 'make use of the abundant supply of labor there to reduce production cost' (ibid: 67). As a result, the majority of the FIE in Guangdong are Hong Kong based. The Boston Consulting Group (1995: 10) estimated that Hong Kong backed electronics firms accounted for 77% of all electronics firms or 83% of all electronics FIE in the province. By the 1990s the scale of Hong Kong backed electronics firms in Guangdong has even far exceeded those remaining in Hong Kong; that is why the MIT research group call it "Made by Hong Kong" (Berger and

Lester 1997).

By moving their labor-intensive processes to Mainland China, local manufacturers are turning their operation in Hong Kong into controlling headquarters (Chiu et al. 1997). R&D activities are mainly conducted in their Hong Kong establishments, and more sophisticated processes are also retained in their Hong Kong premises while assembly is done in their offshore plants. Therefore, even though the industry shows a sharp increase in the value-added per person from the late 1980s onwards, Hong Kong has hardly introduced systemic transformation in its industrial activities (see also Hong Kong Census and Statistics Department 1993). Quite the opposite, the majority still remain largely OEM suppliers for overseas buyers (Berger and Lester 1997; Chiu et al. 1997; Enright et al. 1997; Hobday 1995; Hong Kong Industry Department 1994/95/96). Given their business contacts with local subcontractors and manufacturers based in Mainland China, some Hong Kong manufacturers have even turned into traders, and in some cases, assume only the role as sourcing agent for transnational corporations (Berger and Lester 1997; Hong Kong Census and Statistics Department 1996). Even for those better-performing firms which have upgraded to ODM, their in-house design activities range only from hardware design to software programming, mechanical drawing, building prototype samples and tool-making. Only occasionally are they involved in industrial or conceptual design, while successful upgrade to Own Brand Manufacturing (OBM) is even rarer (HKTDC, Research Department 1997). Not surprisingly, Hong Kong's status as a cost-based competitor in the international marketplace remained unchanged, as the Boston Consulting Group (1995) notes:

“The Hong Kong domestic electronics industry is among the smallest in the region, and is the only one which has been contracting in real value over the past five years. In terms of capabilities, the Hong Kong industry is grouped with the new low-cost manufacturing bases in Thailand,

Malaysia and China as a cost-based competitor with relatively few capabilities in product innovation and development” (p.199).

INERTIA IN UPGRADE AS A STRATEGIC CHOICE

If Hong Kong has stagnated over the past three decades as a cost-based competitor in the international marketplace, it may well be the case that the territory kept doing what it did best – international subcontracting. After all, “local manufacturers have traditionally profited from moving quickly in and out of products and markets” (Dataquest Inc. 1991: IV-64). On one hand, its strength lies in quick response to market changes -- most producers can complete product designs in less than twelve months and produce from order to shipment in less than six months (Dataquest Inc. 1991: Appendix IV-15). On the other hand, they are more reliant on market intelligence than advancement in core technological development for survival, catching up with recent development of parts and components by acquiring them in the market instead of internalizing such processes of production (Chiu et al. 1997). With the constantly changing international division of labor offering ample opportunities in various market segments, Hong Kong just expanded into those product lines given up by other advanced countries when the latter upgrade their product portfolio:

‘Most electronics companies in Hong Kong have exploited the low-cost, flexible manufacturing engine ... The emphasis has been on producing electronics products which have already been created and accepted by the market, and doing so with lower manufacturing costs. At some point in the product life cycle, the creators of these products, which usually have higher manufacturing costs, no longer earn what they consider to be an acceptable profit margin. The market demand for the products, however, remains. At this point, Hong Kong companies, with their low-cost, flexible manufacturing can quickly fill the gap and produce these products at a higher profit margin. Of course, over time, this profit margin continues to erode even for the Hong Kong companies. At that point, the Hong Kong companies quickly begin producing other products with acceptable profit margins, and the cycle goes on’ (Berger and Lester 1997: 202).

Collective Preoccupation with Low-end Market

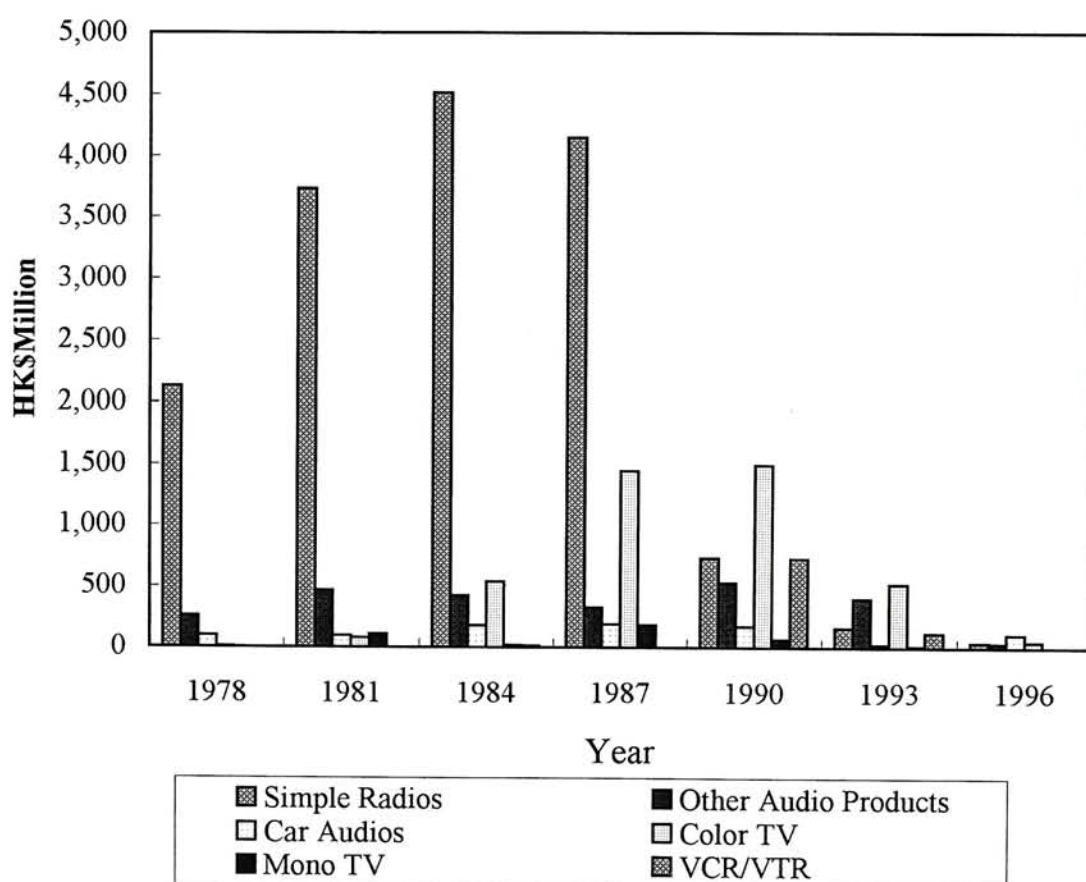
Underlying Hong Kong's excellence in international subcontracting is a strategic preference for following in the rear over catching up with other rivals in the international race. The most illustrative case of such strategic preoccupation with the low-end market is probably the audio-visual (AV) sector, a consistent leader in Hong Kong electronics industry.

Hong Kong started the assembly of transistor radios in the late 1950s, making it the first Asian economy outside Japan to develop consumer electronics (Gregory 1985:12). Closely following the invention of the radio cassette recorder in the mid-70s and the introduction of stereo systems in 1979, Hong Kong radio production was in full swing in the late 70s through 1981 when there were some 400 firms in the field (HKTDC 1984b). By the late 70s, Hong Kong had even risen to share with Japan the leadership in the world's radio production by almost dominating the lower end of the market (Gregory 1985: 9-13).

But while Hong Kong was the first to benefit from Japan's upgrade from simple to multifunctional audio products, its propensity to catch up in the international race kept slowing as Japan moved further upwards to such items as digital audio equipment, color television and video-tape recorder. In fact, simple radios -- portable radios, clock radios and portable radio recorders -- dominated Hong Kong domestic exports of audio-visual products throughout the 1980s (Figure 2.4). Higher value-added items including car audio, color TV and VCR/VTR had never come close to even half of the export value of simple radios before the late 80s. While massive relocation resulted in the decline of simple radios since the late 80s, other product segments performed not much better. By the late 80s there was virtually no VTR manufacturer in Hong Kong, with only several TV manufacturers producing mostly

14-, 20- and/or 21-inch color models (HKTDC, Research Department 1990). The audio segment was, as usual, a bit better than its video counterpart, with a few manufacturers already developing CD players in 1989 (ibid). However, even when quite a few manufacturers are producing laser-based audio equipment by the mid-90s, radio receivers are still the only AV product for which Hong Kong claims to be the world's leading exporter (HKTDC, Research Department 1997).

Figure 2.4: Hong Kong Domestic Exports of Major Audio-Visual Products at 1990's Constant Price, 1978-96.



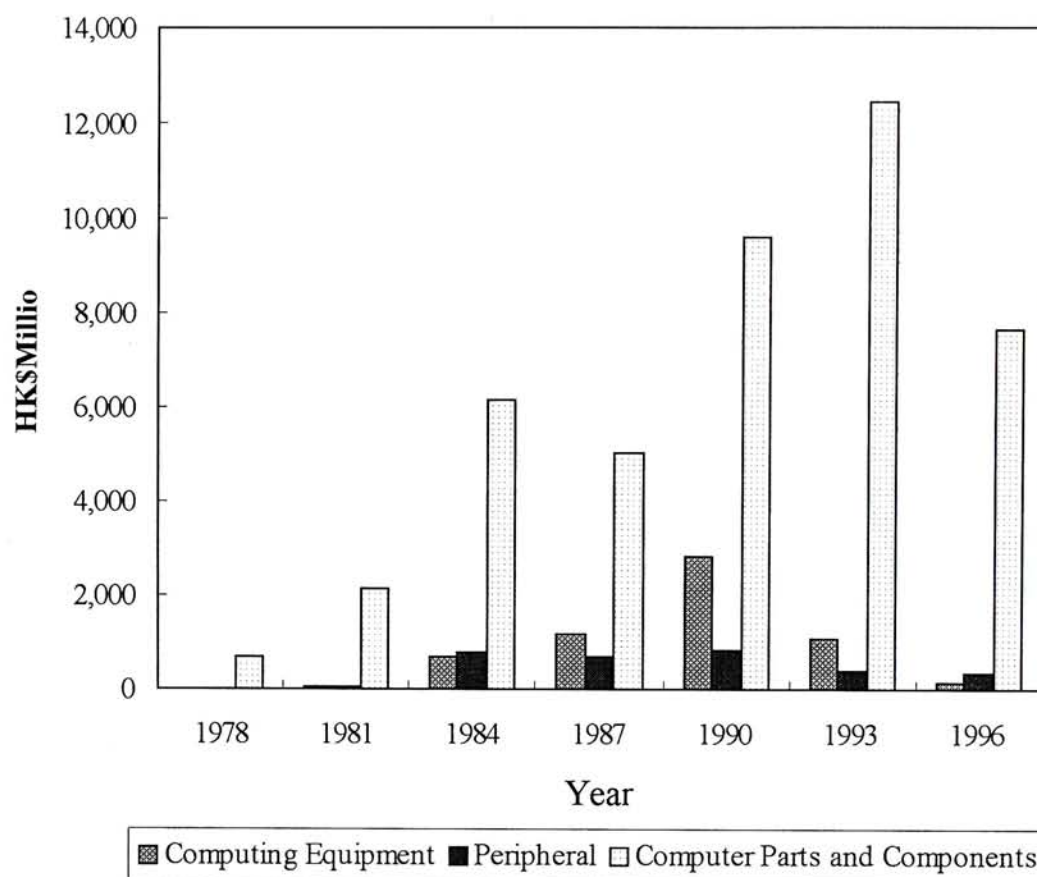
Notes:

1) Each category in this figure is composed of more than one 6-digit items listed in *Hong Kong Trade Statistics*. Simple Radios include “portable radios with sound recorders”, “portable radios” and “radios with clocks”; Other Audio Products includes “radios with hi-fi and sound recorders”, “radios with hi-fi”, other gramophone and record player”, cassette tape sound recorders”, “audio frequency electric amplifiers”, “amplifier units nes”, dictating machine sound recorder nes”, other sound reproducing apparatus”; Car Audios include “car radios with sound recorders” and “car radios”; Color TV includes “colour TV”, “colour TV combination”, portable colour TV”, “portable colour TV combination”; Mono TV includes “mono TV”, “mono TV combinations”, “portable mono TV” and “portable mono TV combinations”; and VCR/VTR includes “TV sound/image recorders and reproducers”.

2) The constant price is calculated by deflating the nominal price by the volume index as listed in Hong Kong Census and Statistics Department (1998) *Estimates of Gross Domestic Product*.

Source: Hong Kong Census and Statistics Department, *Hong Kong Trade Statistics*

Figure 2.5: Hong Kong Domestic Exports of Computer Products at 1990's Constant Price, 1978-96



Notes:

1) Each category in this figure composed of more than one 6-digit item listed in *Hong Kong Trade Statistics*. Computing Equipment comprises “complete digital auto data processing machines”, “complete microcomputer system”, “complete digital central processing unit”, “complete microcomputer digital central processing unit” and “data processing equipment nes”; Peripheral comprises “peripheral units, control and adapting units”, input or output unit” and “storage unit”; and Computer Parts and Components comprises “ parts nes of automatic data processing machines”, electronic components for computers”, and “parts nes of the computer products”:

2) The constant price is calculated by deflating the nominal price by the volume index as listed in Hong Kong Census and Statistics Department (1998) *Estimates of Gross Domestic Product*.

Source: Hong Kong Census and Statistics Department, *Hong Kong Trade Statistics*

Astonishing as it may sound, the computer industry poses a more similar than different case from the audio-visual sector. Some local R&D projects on personal computers had already started as early as in 1978 (HKTDC 1984a), but this early effort earned Hong Kong only a humble computer industry until the early 80s. With the launch of the first IBM PC system in mid 1982 came the “PC revolution,” and Hong Kong was again fast to capitalize on the growth opportunities to embark its position in the international marketplace by multiplying its exports in just a couple of

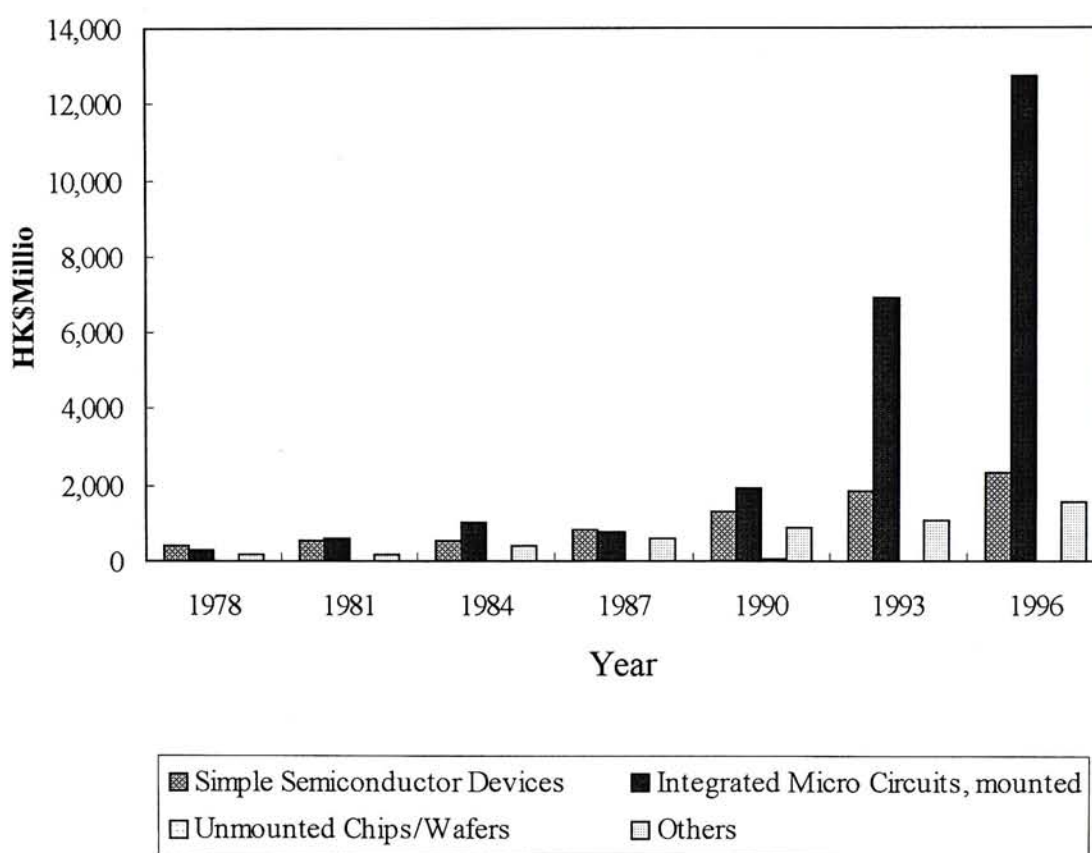
years (Figure 2.5). In 1984 there were already 20 to 30 companies involved in the manufacture of personal computers in Hong Kong (ibid.). These manufacturers came from a diverse background ranging from audio product to electronic watch and even garments, demonstrating Hong Kong's flexible adaptation to international market changes. Despite the fact that most of locally designed products fell into the low end of the market (ibid: 3), the territory did enjoy enormous growth throughout the 1980s as a follower in the rear (Figure 2.5). By the late 80s Hong Kong might even claim a healthy computer industry, producing both desk-top and lap-top PC systems, as well as all kinds of peripherals including keyboards, monitors, disk drives, modems, memory cards, various add-on cards, and even printers (HKTDC, Research Department 1988).

Yet Hong Kong computer manufacturers never caught up in the technology race, following the footsteps of its audio-visual counterparts. As technological capability took charge in the multimedia boom in the 1990s, the territory could barely claim a steady business only in parts and accessories, and to a much lesser extent, in peripherals (Figure 2.5). This assessment remains valid even we take the massive relocation into consideration, as most Hong Kong backed manufacturers in Guangdong are still engaged in the production of computer parts and accessories like motherboards, add-on cards, disk controllers, keyboards, multimedia cards, CD-ROM drives and game controllers (HKTDC, Research Department 1997).

Even the semiconductor sector travels on quite the same trajectory in Hong Kong. As in the case of consumer electronics, Hong Kong was the first Asian economy outside Japan to get into the semiconductor industry (Gregory 1985). In an attempt to defend themselves against Japanese rivals, Fairchild led the US semiconductor manufacturers to seek cost-competitive production sites in Asia by the early 60s, the

first choice being Hong Kong, ‘the only location that then offered the essential conditions for a successful assembly operation’ (Mackintosh Consultants Ltd 1982: 71). By the late 1960s the territory had become the principal assembler of semiconductors in Asia for the US market (Henderson 1989: 98). By the early 80s three or four local firms had acquired fabrication capability of up to four-inch wafers for LSI (large-scale integration) devices (Mackintosh Consultants Ltd 1982: 72).

Figure 2.6: Hong Kong Domestic Exports of Semiconductor Devices at 1990’s Constant Price, 1978-96



Notes:

1) Each category in this figure is composed of one or more 6-digit items listed in *Hong Kong Trade Statistics*. Simple Semiconductor Devices include “diodes”, “transistors”, “photocells” and “other simple semiconductor devices”, Integrated Micro Circuits, mounted include “integrated micro circuits, unmounted”, Unmounted Chips/Wafers includes “integrated micro circuits, unmounted chips wafer”; and Others include “electronics components and parts within group 776”.

2) The constant price is calculated by deflating the nominal price by the volume index as listed in Hong Kong Census and Statistics Department (1998) *Estimates of Gross Domestic Product*.

Source: Hong Kong Census and Statistics Department, *Hong Kong Trade Statistics*

The strength of Hong Kong's semiconductor industry in the earlier phase is shown by the fact that even a very large part of these semiconductor devices were

consumed locally, the annual export value amounted to no less than HK\$1,000 million throughout the 1980s (Figure 2.6). By 1986 there were already 21 companies in Hong Kong engaged in semiconductor manufacturing (of which six are locally owned), making the territory an emerging core of the regional division of labor (Henderson 1989: 112).

Throughout the 1990s Hong Kong has indeed expanded in testing and packaging activities, as shown in the export value of mounted IC (Figure 2.6). Ironically, Vitelec of Taiwan and Motorola of US formed a joint venture in Hong Kong in 1996, only to make memory ICs generations behind the technological frontier, even though watch & clock ICs, voice & melody ICs and electronic toy ICs have been fabricated locally for nearly 20 years (HKTDC, Research Department 1997). This is to say, the Hong Kong semiconductor sector remains only a follower in the rear, especially when we bear in mind the success of both Taiwan and South Korea in technological catch-up.

These episodes all point to a strategic preference for international subcontracting in the Hong Kong electronics industry (see also Chiu and Wong 1998 for a similar case in the LCD sector). The fast start in the 1970s demonstrates how effective the business model is in the earlier phase of development, with the subsequent decline of local production pointing to the systemic limit of cost-based competition. Most interesting of all, Hong Kong survived the challenge not by industrial upgrading, but instead, by revitalizing the business model through massive relocation. The predominance of small firms is not as much a factor as the persistence of subcontractor orientation, as the strategic preference for international subcontracting lasted throughout the “made-by-Hong-Kong” era when the average scale has become much larger.

Table 2.2: Leading Export Items of Hong Kong Electronics Industry, 1978-96

	1978	1981	1984	1987	1990	1993	1996
1 st	LCD watch (1.88)	LED/LCD Watch (4.27)	Computer Parts (6.13)	Quartz Analog Electronic Watch (7.07)	Quartz Analog Electronic Watch (11.71)	Computer Parts (12.12)	Mounted IC (12.06)
2 nd	Portable Radio (1.85)	Computer Parts (3.09)	Quartz Analog Electronic Watch (3.12)	Computer Part (5.38)	Computer Part (9.63)	Part for RF Apparatus (7.51)	Computer Part (7.22)
3 rd	Clock Radio (1.47)	Portable RCR (1.99)	LED/LCD Watch (2.98)	Portable RCR (2.35)	Radio Part (3.22)	Electronic Watch (6.97)	Electronic Watch (5.80)
4 th	Computer Parts (1.33)	Portable Radio (1.98)	Portable RCR (1.87)	Radio Part (2.30)	TV Part (2.56)	Mounted IC (6.70)	Part for RF Apparatus (3.85)
5 th	Portable RCR (0.99)	Clock Radio (1.49)	Portable Radio (1.82)	LED/LCD watch (2.29)	Computer System (2.37)	Printed Circuit (2.58)	Printed Circuit (3.23)
6 th	Transistor (0.72)	TV Game (1.46)	Telephone Set (1.80)	Telephone Set (1.78)	Mounted IC (1.95)	Cassette Tape Sound Recorder for Office Use (1.67)	Cassette Tape Sound Recorder for Office Use (2.02)
7 th	Mounted IC (0.61)	Quartz Analog Electronic Watch (1.28)	Radio Part (1.63)	Video Tapes (1.47)	Printed Circuit (1.92)	Part for Audio Equipment (1.67)	Part for Audio Equipment (1.95)
8 th	Pocket Calculator (0.60)	Mounted IC (0.86)	Clock Radio (1.34)	Color TV (1.45)	Radio Telephonic Receiver (1.85)	Transistor (1.46)	Transistor (1.87)
9 th	TV Game (0.49)	Cassette Recorder (0.64)	Mounted IC (1.15)	Portable Radio (1.33)	Static Converters/ Rectifiers (1.65)	Static Converters/ Rectifiers (1.38)	Other Semicon- ductor Device (1.44)
10 th	Cassette Recorder (0.47)	Electronic Clock (0.59)	Computer Peripheral (0.86)	Computer System (1.20)	Photocopying Apparatus (1.55)	Part for Telecom Equipment (1.23)	Part for Telecom Equipment (1.26)

Note: Figures in each bracket denotes the value in HK\$ billion at 1990's price, calculated by deflating the nominal price by the volume index as listed in Hong Kong Census and Statistics Department (1998) *Estimates of Gross Domestic Product*.

Source: Hong Kong Census and Statistics Department *Hong Kong Trade Statistics*

Collective Inaction in Industrial Upgrading

The strategic preoccupation with international subcontracting is so persuasive in the field that Hong Kong electronics firms did little to transform their status as a cost-based competitor even when upgrade opportunities became abundant in the 1980s.

Product upgrade is limited, whereas process innovation and technology catch-up are so lacking that relocation became “the only means for the electronics manufacturers to survive. In order to stay cost competitive, they have to move to PRC” (Dataquest 1991: IV-28). A look at the leading export items over the past two decades confirms the clustering of Hong Kong electronics firms around mature and/or fad products whose profit margins necessarily stagnate, if not decline, as time goes on (Table 2.2). Notable examples include LCD/LED watches and TV games through the late 70s to early 80s, telephone sets during the mid-80s, video tapes in the late 80s, radio telephonic receivers (including such telecommunications equipment as CB radios and transceivers) through the late 80s to early 90s, among others. Apart from consumer products, the part and component sector follows a similar path, with the early 90s seeing the rise of discrete components (static converters, rectifiers and transistors), printed circuits together with parts and components for RF apparatus (i.e. TV and radio), audio equipment and telecommunications equipment.

While product upgrade is of humble scale, process innovation and technology catch-up are even more lacking. Dating back to the 1970s when international subcontracting emerged to predominate in the field, the industry’s expenditure on technology development (including product design and process improvement) was already small relative to its scale. It is especially true in consumer electronics, as the whole sector spent only HK\$13 million in product design and process improvement in 1978 (Hong Kong Productivity Centre 1983: 32). Hence it is justified to suggest that “the industry has not been accumulating experience and know-how in technology development” (ibid).

The industry did not report satisfactory performance even in quality control, as one of the very few research reports done in early 1970s with a focus on that

production process in Hong Kong electronics industry (Chiu 1973) discovers:

“[A] large amount of effort and costs has been devoted to the prevention and internal failure sectors of the quality control exercise ... sampling plans are determined subjectively and passively to meet the customer’s need (p.10) ... One can conclude from these figures that Hong Kong is not quite up to date in organizing Q.C. activities (p.15)”.

Even by the mid-80s, there was still a lack of awareness in quality control in most SMEs in Hong Kong, as found by Sit and Wong (1989):

“For most SMI entrepreneurs, it is evident that much attention has been paid to new machinery as a cure for production and technological problems ... their perspective on improving technology is very narrow ... When asked about their opinion on low cost automation, 2/3 of the sample firms claimed that they had not heard of it...” (p.168-70).

Table 2.3. Gross Addition to Fixed Assets as a Percentage of Gross Output of Hong Kong Electronics Industry, 1983-95.

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Office Automation Equipment	N/A	-0.03	28.23	40.20	10.69	3.32	3.13	8.51	8.14	4.21	-2.19	4.16	5.53
Computer Products	N/A	3.23	0.57	5.73	3.14	4.08	5.14	2.87	1.78	2.30	3.12	4.51	4.29
Consumer Electronics	0.51	2.04	2.18	1.63	3.08	3.51	2.49	2.18	2.90	2.97	1.54	2.98	1.46
Parts and Components	4.83	6.36	5.42	6.16	5.66	6.66	7.34	10.36	7.29	8.78	9.21	9.76	8.27
Industrial Apparatus	3.62	7.17	5.63	15.48	18.46	3.51	14.23	2.44	13.68	15.13	N/A	0.50	0.78
Others	N/A	6.02	2.58	3.47	6.79	3.47	2.36	-2.60	1.79	3.51	N/A	3.21	1.91

Source: Hong Kong Census and Statistics Department, *Survey of Industrial Production*

Even though Hong Kong manufacturers are supposed to prefer installation of new machines to other forms of process innovation, the performance of electronics industry through the early 80s to mid-90s in gross addition to fix assets seems much less than satisfactory (Table 2.3). It is again most evident in consumer electronics, whose investment in fix assets seldom exceeded 3% of its gross output. The

computer sector was not much better, averaging an annual rate of just 3.39% over the period. Even though the part and component sector showed a better record, it had a significantly higher rate only after the 1990s when massive production relocation tends to exaggerate the ratio between gross addition to fix assets and gross output.

Not surprisingly, a study report on industrial automation done in early 90s found Hong Kong lagging two to three years behind Taiwan and Singapore in upgrading to SMT (surface-mount technology) by using automatic pick-and-place machines (Hong Kong Productivity Council 1992):

“In the area of hard automation, the level of automation of Hong Kong electronics industry lags slightly below the optimum ... on the whole, the industry invests in hard automation equipment if forced by their buyers, instead of continually seeking out opportunities to add extra value for, and hence extra value from, their customers” (ibid: 37).

Size limitation matters much less than management attitude in process upgrade of various types, as a major barrier to automation in Hong Kong is “the lack of appreciation of the contribution of manufacturing operations to the value-added of a business in industry” (ibid: 59). In a study on JIT (just-in-time) system Fong (1992) points out the weakness of Hong Kong companies in inventory control, finding management’s misconception more than anything to have hindered Hong Kong’s upgrade to JIT system.

As in the case of process innovation, the intensity of technology innovation – usually carried out in a company’s R&D section – is weak in Hong Kong (Reif and Sodini 1997). In fact, most Hong Kong electronics firms have a relatively weak R&D section. Chiu et al. (1997) did a survey in the mid-90s, finding that more than two-thirds (73.9%) of electronics firms employ no more than three R&D professional staff (p.64). One may again blame the limitation of SMEs, but even relatively well-established firms perform not much better in this regard. Yu (1997) found that “large

electronics companies in Hong Kong spent money on R&D mostly for the transfer of technology or for imitation, not for technological breakthrough or designing brand new products” (p.125). Not surprisingly, even though Hong Kong has been fast to switch to CAD (computer-aided design) software in product design, the weakness in corporate R&D is so common that the electronics industry was still at its early stage in the application of ASIC (application-specific integrated circuit) (Hong Kong Industry Department 1991). After all, Hong Kong has the lowest R&D spending among the “four little dragons,” estimated at 0.08% of GDP in 1992 (Baker and Goto 1998: 256).

FLEXIBILITY OR RIGIDITY: A SECOND THOUGHT

Hong Kong electronics industry has indeed thrived over the past three decades, the 1970s being the take-off stage, with the next two growing at much slower rate. Certainly a relatively small base helps record that remarkable expansion in the 1970s, but the slower growth thereafter cannot be explained merely by resorting to a larger base value. Indeed the relative decline of industrial competitiveness is shown by the fact that Hong Kong’s growth rate throughout the 80s is much smaller when compared to what is achieved by South Korea, Taiwan and even Singapore over the period (Dataquest Inc. 1991). Even though the Hong Kong electronics industry has long been renowned for its flexible adaptation to market change, the territory did little to transform its role in the global division of labor as an OEM supplier in low value-added sectors, even after upgrade opportunities has become more abundant from the 1980s onwards.

After all, Hong Kong electronics is so attached to international subcontracting that its lack of upgrading effort through process innovation or technological catch-up confines itself to the status as a follower in the rear. This is exactly why one may take

flexible adaptation to frequent market change as a "Hong Kong Advantage" (see, for example, Enright et al. 1997; and Yu 1997), while others may just doubt whether a strategy of this kind is sustainable (see, for example, Berger and Lester 1997; and Chiu and Wong 1998). But if there is any validity in my contention that the preoccupation with international subcontracting is associated with the lack of industrial upgrading, we had better look into the mechanism through which most local manufacturers get locked into labor-intensive OEM.

CHAPTER THREE

UNCOVERING LOCAL DYNAMICS

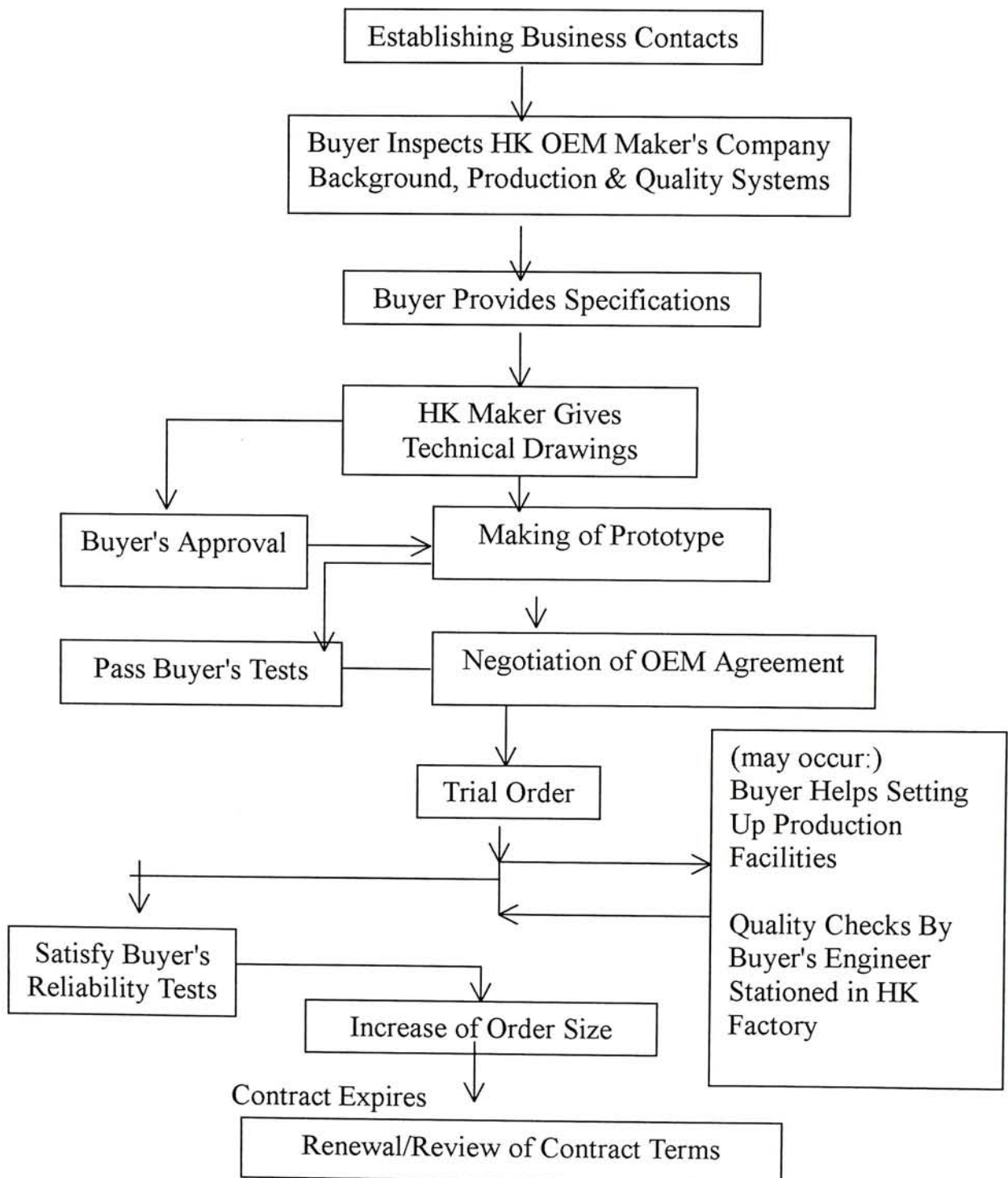
If Hong Kong gets locked into labor-intensive manufacturing through collective submission to the subcontractor role in buyer-driven GCC, it begs to ask why these subcontractor firms are so reluctant to upgrade. Power asymmetry built in buyer-driven GCC helps explain such inertia on the part of local suppliers; success in international subcontracting turns into a deterrent to industrial upgrading so long as the existing business arrangement is not supportive in that regard. But unlike many other scholars who take Hong Kong's preoccupation with the subcontractor role as something self-explanatory – there just exists many firms that are very well adapted to the subcontractor role – this chapter seeks to uncover the lock-in mechanism. After all, its stagnation in OEM over decades has been full of dynamics at both the field and firm levels. With the electronics field connected to buyer-driven GCC from the outset, those who secure close contact with overseas buyers are best positioned to set up an industrial firm. With the vast majority of industrial entrepreneurs arising from this subcontracting network, the industrial field saw the rapid rise of sales-led subcontractor – the organizational model that is set to excel in the subcontractor role at the expense of other possible tasks. As it turns out, collective preoccupation with international subcontracting becomes collective inaction in industrial upgrading.

INTERNATIONAL SUBCONTRACTING AS A DOUBLE-EDGED SWORD

As detailed in chapter 2, Hong Kong electronics industry has since its inception engaged in international subcontracting through buyer-driven GCC. With these buyers mostly importers, distributors and chain stores aiming at price-competitive products, the local industrial field has been linked to a business system in which price

rather than quality is the primary concern (HKTDC 1991). It has important implications for the local industrial scene because a buyer-driven GCC is by definition a governance structure in which buyers decide who to produce what for whom. With little hint for upgrade spreading across the network, local suppliers just lack an initiative to do so.

Figure 3.1. Typical Procedures in Reaching an OEM Arrangement



Source: HKTDC (1991: p.7)

Buyer-driven GCC as Truncated Market

In Figure 3.1 that typifies an OEM arrangement, we see how unfriendly a business environment it is for local suppliers to upgrade their industrial activities. After all, a buyer takes overall control over allocation of resources across the business network by assigning what to be produced for whom. With virtually no control over how its products are distributed, a local supplier can but limit its scope to contract manufacturing. While it may on occasion perform some product design for its buyers, production upon order more or less exhausts what it is supposed to do in such arrangement. This is why I call the buyer-driven GCC a truncated market: a buyer's control over the retailing end segregates suppliers from end users; suppliers may never receive feedback from end users, whereas end users may never realize from which supplier their consumption comes.

The weakness of local suppliers in marketing and the tight control of overseas buyers in distribution are just two sides of the same coin. Underlying this business arrangement is such power asymmetry that a buyer's approval is always prior to anything done on the part of a supplier (Figure 3.1), leaving most suppliers with few choices but to take buyer's orders and sales forecast as the primary source of market information. An example is Lai's description of the procedure of his own firm, Fook Lung Ltd., a 500-staff clock radio maker for organizational buyers since 1982⁵:

"Ever before we develop a new model, we gather information. This is very important, and we usually contact our existing customers and potential buyers for advice. Usually, before our customers come to Hong Kong to meet us we have already asked for their suggestions. Then we form a concept, draft drawings to see what to be refined, and prepare mock-ups for their assessment. After their approval, we will go ahead for mechanical drawing and mold making... This is typical of new product development procedure, in which buyers take a central role in providing information on market trends".

⁵ All company and personal names in this chapter are changed to assure our interviewees of anonymity.

Information asymmetry of this kind helps explain why a local supplier is prone to get locked into the subcontractor role. As long as a supplier takes buyers' orders as market demand, and buyers' forecasts as market trends, it restricts its operation to existing needs of its buyers, letting other business possibilities go unnoticed. Illustrative again is the case of Fook Lung Ltd., as Lai explains why the firm has never diversified away from clock radios:

"We often look into the electronics field for business opportunities, just being unable to identify a target product. Diversifying into any product line may cause difficulty for our firm. Well, the problem does not lie in the product, but on market demand ... I often communicate with my buyers to see which product line to head for, just to be told "none". Therefore, we do what we have been doing well. That puts us in an advantageous position. We don't know how risky it is to diversify away; to stick to our own specialty is to play safe".

OEM as Steady Business

If power asymmetry in an OEM arrangement makes a supplier unlikely to upgrade its activities as long as a buyer gives no hint, it begs to ask why a supplier continues its engagement with such business arrangement. This leads us away from the constraining side to the enabling side of the business arrangement; while excellence in OEM may not lead a supplier to industrial upgrading, it is not quite the case in terms of corporate growth. Instead, a supplier who satisfy its buyers often ensures stable orders through their close ties, winning it much room for expansion (Figure 3.1).

Forming a long-term partnership with a buyer often wins a supplier repeated orders of larger size and longer duration. This is attractive enough for many a subcontractor, who are usually keen in forward planning to fully utilize their production capacity. As in the case of True Light, its emergence as one of the leading electronics groups in Hong Kong only followed its rapid expansion in the OEM marketplace throughout the late 80s to early 90s. In the words of Pang, its founder

and chief executive:

“Production relocation that facilitated expansion in production capacity was the turning point in our group’s history. But what made us grow so fast was our ability to lure buyers who formerly went to South Korea and Taiwan. Their large and stable orders made it possible for us to steadily expand our production scale”.

Long-term relationship with a buyer even helps an OEM supplier to outperform its rivals, as a few steps can often be skipped in establishing new order arrangements with old customers. As Lai details the case of Fook Lung, one of the beneficiaries of long-term partnership with overseas buyers:

“Backed by our long-term customers, we are assured of orders every time we release a new model even before we have our molds ready. This puts us in an advantageous position against many of our competitors, who have to seek orders after they have fabricated their molds. As for us, we can ask our customers to make orders just with a draft drawing, permitting us to go on to mold making at least with an order size of break-even level”.

After all, a subcontractor is reluctant to move away from the OEM role in buyer-driven GCC not only because of the power asymmetry but also because of the growth opportunities built in the business arrangement. But as long as the OEM arrangement remains unfriendly to industrial upgrading, a local supplier may enhance its performance as an OEM supplier only at the expense of other possible tasks, and hence becomes handicapped in capturing business opportunities outside the subcontracting network. As Dataquest Inc. (1991) points out Hong Kong’s underachievement in industrial design under the existing business arrangement:

[M]ost of the respondents were involved in electronic system designs and the design of mechanical parts. In most cases, the designs were worked out according to the product specifications and product cosmetics provided by the parent companies or the customers. Only half of the respondents performed product cosmetic designs for some of their products, and design of tooling and molds were not widely provided by the respondents' (IV-20).

Collective Attachment to the Subcontractor Role

To add all up, the more a subcontractor leans towards satisfying buyer's needs, the less likely it becomes capable of pulling away from the subcontracting network. But this helps account for Hong Kong's lack of industrial upgrading only if the majority of local firms did build their competence around the needs of their buyers. This reminds us of a number of scholars, who identify a peculiar business orientation that helps drive local manufacturers closer to the subcontractor role (Chau 1993; Chen 1995; Hamilton 1997; Yu 1997). Among them is the pioneering study of Chau (1993), who typifies Hong Kong entrepreneurs as "merchant entrepreneur":

“A merchant aims at securing income or wealth by the exchange rather than the production of goods ... the process may involve fabricating or manufacturing. But if he has no interest in the commodity itself, or in the wants it satisfies; if the discovery excites him solely because of its profit potential, so that when the undertaking ceases to bring in supernormal profits he will not hesitate to dump the project, then he is what I call merchant entrepreneur” (p. 23-5).

As regards personal and behavioral traits, a merchant entrepreneur is thus likely to be a non-specialist who adheres to a short time horizon with little commitment to any business line. This contrasts with an industrialist who “competes on the strength of the quality of his product, or on cost effectiveness ... [and] takes pride in his product” (p.25). In response to those who query why Hong Kong industries continued to specialize in labor-intensive products when “late-comers” like Korea and Taiwan shifted to more capital- and technology-intensive products, Chau simply replies: “this ceases to be a surprise if we know how the merchant entrepreneurs operate” (p.27).

Echoing Chau is Yu (1997), who uses more systematically collected data in his monograph to substantiate the contrast between two ideal types of entrepreneurs -- the "Kirzorian entrepreneurs" who adhere to "adaptive response" as compared to "Schumpeterian entrepreneurs" who prefer "creative response". The predominance of

"Kirzerian entrepreneurs" in Hong Kong is argued to be the driving force behind economic change over decades. As in the case of electronics industry, these Kirzerian entrepreneurs thrive by their alertness to business opportunities such that they rush to the most popular products with low value added, low profit margins but a quick return. After all, two thirds of the electronics firms covered by Yu's survey in 1994 have been and would continue to be OEM suppliers. This is to say Hong Kong's stagnation in the OEM role has its root in strategic orientation at the firm level:

"Indeed most Hong Kong firms are market driven, depending less on advanced technology and more on predefined product market guidelines to direct their business activities ... It is worth noting that [even] large electronics companies in Hong Kong spent money on R&D mostly for transfer of technology or for imitation, not for technological breakthrough or designing brand new products" (p. 125).

UNCOVERING LOCAL DYNAMICS

Most acknowledge the prevalence of "subcontractor orientation" of this kind in Hong Kong's manufacturing sector as a whole (see, for example, Enright et al. 1997 for a similar assessment), only to ask where it originates. As we are about to show, legacy matters a lot in selecting a group of industrializing agents whose attachment to OEM business is constituent of the persistent prevalence of the "subcontractor orientation" in the field. With the trading legacy came a far-reaching buyer/trader network that eased Hong Kong's insertion into buyer-driven GCC during the post-war era. Consequently, the manufacturing sector evolved around a buyer-driven, trader-mediated subcontracting network in which local industrial firms could get more products sold simply by getting more orders from overseas buyers and/or local traders. Thanks to this peculiar mode of industrialization in which a fast lane to success in international subcontracting is available, the subcontractor model outgrew other alternative business models in the industrial field by attracting hundreds of

newcomers and spin-off firms to follow. With the majority of industrial firms being so attached to a business arrangement that is unfriendly, if not hostile, to constant upgrading, it is no surprise that the electronics field has failed to generate any systematic transformation over the years.

Traders as Industrializing Agents

Hong Kong was a colony built by the British as a trading port for their commercial penetration into the Far East. With the colonial legacy comes an extensive institutional network for handling commercial transactions that not only contributed to the entrepot development before the Second World War, but also served the needs of export-oriented manufacturing industries during the post-war era (Chiu et al. 1995). In particular, this network made Hong Kong a top candidate when mass merchandisers (i.e. department stores, large chain stores and supermarkets) in major North American and European markets looked for new sources for the most price-competitive consumer electronic goods in late 50s (Gregory 1985). Technically put, this pre-existing commercial network paved the way for Hong Kong's smooth insertion into buyer-driven GCC.

Backed by a web of trading-related organizations, large overseas buyers could from the very beginning deal directly with some large manufacturers in Hong Kong. But the local trading community did play a vital role in matchmaking most local factories to overseas buyers during the early phase of industrialization (Espy 1970; see also Sit et al. 1979; Sit 1985). To illustrate I quote in length from Espy (1970), whose pioneering research in business strategies of Hong Kong manufacturing sector turns out to be a rare documentation of this earlier industrial scene⁶:

⁶ As Espy did not single out the electronics industry in his study that covers only 3 electronics firms in

“Almost all of Hong Kong’s export production is for buyers who represent manufacturers, wholesalers and retail chains in the market countries. The Hong Kong manufacturer is often simply a contract producer ... production is almost always against firm orders, never for stock ... He is concerned only with finding foreign buyers who will give him contracts for producing items he is equipped to make (p.61) ... If the buyer is experienced and is placing a large order for one or several similar items, he will know which Hong Kong manufacturers are capable of filling his orders satisfactorily and can thus seek his own quotations ... Smaller buyers, especially those interested in a variety of different items, often find it to their advantage to channel their buying through the export buying office of a large British trading company such as Jardine-Matheson, Gilman or Dodwells (p.63-4) ... There are several thousand trading companies in Hong Kong ... Most of these firms are owned and operated entirely by Chinese, but there are also Indian, Pakistani, American, British, Australian and Canadian companies offering buying services for overseas customers (p.66)”.

In other words, Hong Kong’s manufacturing industry has from the very beginning evolved around a three-tier system in which overseas buyers give orders, traders make matches, and factories perform production upon orders. Under this system most buyers are isolated from local producers, except that a handful of large overseas buyers maintain relatively close ties with renowned Hong Kong manufacturers. Usually, an overseas buyer sends a trade inquiry to a trading house, which then gets several quotations from local manufacturers (on an F.O.B. basis) and submits to the buyer one quotation under its own name (on a C.I.F. basis). If an order follows, the trading house places its own order with the Hong Kong firm, and then assumes all responsibilities for inspection prior to packing, shipping, insurance and export documentation. Without these trading houses, it is hardly imaginable how small buyers from all over the world could make contact with thousands of anonymous factories in Hong Kong (Espy 1970; see also Sit et al. 1979).

The incorporation of Hong Kong’s manufacturing into buyer-driven GCC

a total of 27 cases, my paper does not intend to make generalization from his study.

through a trader-mediated network in turn fostered the growth of subcontractor firms by paving them a fast lane to success in the OEM marketplace. With abundant business opportunities spreading across the subcontracting network, it requires little technical or business know-how for a subcontracting firm to get more products/service sold by seeking more buying orders. The only imperative to secure orders may well be the mastering of general-purpose production equipment that ensures flexible adjustment to customers' orders for a variety of products. This is indeed what Espy (1970) identifies as a common way to do business in the 60s:

"[F]inding foreign buyers who will give him contracts for producing items he is equipped to make. He wants contracts which are large enough to permit economical production quantities and provide the incentive and means to grow ... He is usually eager to obtain repeat business, as this requires a minimum tooling and employee training costs. These problems, rather than retail distribution or attracting consumers, are the major concerns of the Hong Kong manufacturer as he seeks orders from foreign buyers" (p.61-2).

The Rapid Rise of Subcontractor Firms

The institutionalization of a buyer-driven, trader-mediated subcontracting network hinted the evolution of the organizational field by cultivating a business environment in which factories with a strong presence in that network are assured of corporate prosperity. For hundreds of small factories, securing a close ties with trading houses often made them more viable than they would otherwise have been (Sit 1985; see also Espy 1970; Sit et al. 1979). In fact, many local factories were so small that they even could not arrange the clerical people to handle shipping, insurance and documentation, and just depended on trading houses as the major, if not the only, source of orders. In addition to managing export affairs, these trading firms sometimes offer substantial assistance to those manufacturers whom they considered to be reliable suppliers, handling the purchase of raw materials and even arranging loans and machinery. As

for large firms which usually do not depend on trading houses for orders, their growth hinges on an ability to maintain a close tie with overseas buyers. Therefore, a common feature among high-growth industrial firms during this early phase is that their chief executives personally conduct most negotiations with their buyers and many of them traveled extensively to seek buyers in their market countries (Espy 1970).

As a result of the priority of business connections, those who had already been embedded in the subcontracting network are even better posited to seize business opportunities than technical and managerial experts are. It is evident in the 1970s, as Sit et al. (1979) report in their survey that around 70% of SME entrepreneurs set up their own firms after serving in the industrial sector, and 63.6% of those in the electronics industry had their first job exactly in the electronics industry. Sit and Wong (1989) reaffirm the pattern in a survey done a decade later: "[t]he typical pattern for about 80% of the entrepreneurs is that they worked in one job, accumulating capital and know-how, before becoming employers" (p.104).

This is to say that the subcontracting network is built with a self-reinforcing mechanism; newcomers to the field are likely to join the subcontracting business because of past experiences in a subcontractor firm. Though I can find no data to detail the background of these spin-off entrepreneurs, the priority of working experience over formal training in the likelihood of becoming an industrialist in Hong Kong does help spread the subcontractor orientation across a field. After all, a salient feature of SME entrepreneurs in Hong Kong is their lack of formal training: around 70 percent of all respondents have no formal training in either technical or managerial know-how, but only acquired this knowledge in their former jobs (Sit et al. 1979; Sit and Wong 1989). Without alternative tool-kits, these spin-off entrepreneurs are likely

to enter the field only as followers of the subcontractor model. On one hand, the fact that 82.8% of these SME industrial firms had an initial proprietor fund of no more than HK\$200,000 (Sit et al. 1979) implies that they had few choices but to join the subcontracting network. On the other hand, it is hardly imaginable how small firms like these could have survived without trading houses performing an intermediary role between overseas buyers and small industrial firms.

With the institutionalization of the subcontracting network in which insiders are most likely to start up an industrial firm, the subcontractor model does not take long to become the dominant business model in the industrial field. After all, the Advisory Committee on Diversification (1979) notes that firm strategies had already converged by the late 1970s to govern Hong Kong's industrial development as a whole:

"[E]ach industry includes a large number of small manufacturing establishments whose activities are largely responsive to buyers' orders. There is a lack of a reasonable number of large factories which have the capability and incentive to invest in the training of skills at various level, and in industrial support facilities and technical back-up services"(p.75).

Institutionalization of the Sales-led Organizational Form

In line with this peculiar mode of industrialization in which the subcontracting network paves local industrialists a fast lane to success in buyer-driven GCC, the organizational form that best fulfills the subcontractor role eventually prevails in the field. To take a closer look at the dominant organizational form, I trace the growth trajectory of practically all publicly listed electronics firms in order to see which set of business strategies constitutes its success, as defined by listing on HKSE⁷. To typify but not over-simplify, I categorize their business orientations around the three functions that virtually all industrial firms perform, namely, sales and marketing,

⁷ Based on data availability, I included 53 firms in the profile. As it aims to specify the growth trajectory of local firms, foreign groups like China Aerospace, ASM Pacific, Legend and Pro-View are

production, and research and development (Table 3.1). Each of the 53 firms certainly employs a combination of all three types of strategy in the course to listing. But it makes sense to attribute a firm's success to one type of strategy as long as we can identify one that is consistently given top priority in its choice of growth strategies. While the coding is subject to subjective judgment on qualitative data that include IPO (initial public offering) documents, annual reports, newspaper reports and/or articles in books and journals, it is by no means ambiguous (see Appendix 1 for details). Quite the contrary, the business orientation of a firm corresponds to its choice of growth strategies during formation years (see, for examples, Boeker 1989; Fligstein 1990; Grove 1996).

Table 3.1: Functional Categorization of Business Orientations

Functional Domain	Business Orientation	Growth Strategy
Sales & Marketing	Getting more products/services sold by strengthening market presence.	Product Shift and/or Diversification; Market Diversification; Brand Development; Distribution Network Building; Business Diversification, etc.
Production	Enhancing the competitive edge in quality and/or efficiency by a focus on the production arena.	Vertical Integration; Inventory Control; Advancement in Facilities; Automation; Quality Assurance, etc.
Research & Development (R&D)	Craving a market niche by building an expertise in technological know-how and/or developing proprietary product and/or technology.	Product Development; Product Innovation; Applied Research; Technology Development, etc.

Source: see text.

excluded. So are those getting into the field through merger, Semi-tech and Grande being notable examples.

Table 3.2: The Typical Path to Success of Electronics Firms Listed on HKSE

Sector	Companies	Typical Path to Success
Consumer Electronics	Alco; Golden Power; Great Wall; Hanny; Hanwah; Kong Wah; Kosonic; Leading Spirit; Luks; Ngai Lik; Orient Power; Recor; Starlight; Tomei; Tomorrow; Wanon;	These firms were usually started as a small factory concentrating on the assembly of simple consumer goods, transistor radios being the most notable example. Almost without exception, they relied on orders from overseas merchandisers. While their growth hinges on the ability to keep pace with these merchandisers in terms of volume, delivery and quality, their success usually followed a timely release of a big-hit item, as for examples, radio cassettes recorders in the 80s, magnetic storage media in the late 80s, and CD players in the early 90s. Further growth is usually achieved by a combination of three strategies – sales expansion of current items, constant search for new buyers, and hunting for next big-hit items.
Personal Electronics	Kinson; Prod-Art; RJP; Same Time; Sharp Brave; Truly; Welback;	These firms were usually started as a small factory engaging in the assembly of such items as calculators, hand-held games and electronic watches. Relying on overseas buyers in general and the so-called “gift market” in particular for orders, they are very likely to shift from one product to another. Their fast growth usually followed their quick move to tap into the enormous demand for fad products, as for example, LCD hand-held games in mid 80s. In addition to the three strategies commonly used in consumer electronics, these personal electronics firms are more likely to assist price competition with product differentiation through cosmetic design.
Parts and Components	AV Concept; Daiwa Associate; Honko; K&P; Man Yue; Wing Lee; Wong’s International;	These firms were either started as a trading house or small factory to serve local electronics firms. So, they usually concentrated on such basic items as printed circuit boards, capacitors, diodes and resistors. Their growth is a result of two environmental factors: first, the expansion in local demand after relocation of other electronics firms; and second, the shift of market leaders towards more sophisticated parts. Their success hinged on a timely expansion in production volume to tap into the market demand, with typical examples being resistors, diodes and capacitors in the 90s.

Source: Companies’ IPO documents and annual reports.

There is indeed a typical path to success in the electronics field; the majority -- 30 out of the 53 listed companies -- traveled on the fast lane to success in buyer-driven GCC by adapting to the subcontractor role (Table 3.2). Of these subcontractor firms (excluding two cases for which data on the founder's background are not available), all except three (i.e. 25 in 28) had from the outset been embedded in the buyer-driven, trader-mediated subcontracting network. Almost half of these firms were started as a petty workshop to serve the trader-mediated subcontracting network (11 in 25). As for the rest, their founders all come from the market domain: they either have a trading background before stepping into the manufacturing field (9 in 25) or sales and marketing experiences in another electronics firm before spinning off (5 in 25)⁸.

With their rise in the subcontracting network comes an orientation towards growth characterized by getting more products/services sold through strengthening market presence -- sales and marketing orientation. Indeed the reliance on sales strategies varies little across sectors, be it consumer electronics, personal electronics or parts and components (Table 3.2). The typical pattern: the initial take-off follows a prompt response to overseas buyers' surging order for certain low-margin, large-volume products, and continuous growth hinges on the ability to make product shift by seeking orders from current and/or new buyers. Notable examples of these big-hit products include electronic watches from the late 70s to early 80s, LCD hand-held games in the mid-80s, CD players from the late 80s to early 90s, and basic discrete components from the early to mid-90s. By contrast, in the remaining 23 firms that take alternative paths to success, eight cases lean towards either production-centered or research-driven orientation whereas the other 15 cases show somewhat ambiguous

⁸ Those started as a petty workshop include Kinson, Luks, Ngai Lik, Prod-Art, RJP, Recor, Same Time, Starlight, Welback, Wing Lee and Wong's International; those founders with a trading background include Daiwa Associate, Great Wall, Hanny, Honko, K&P, Kosonic, Leading Spirit, Man Yue and Tomei; and those founders with sales & marketing experience include AV Concept, Kong Wah, Orient

strategic orientation (these alternative cases will be discussed in the next chapter).

Underlying the priority of sales-led strategies in these subcontractor firms is a mode of functional integration in which the sales and marketing function takes the lead. Indeed the R&D function in virtually all of these firms is so weak and passive that a common R&D practice is cooperation with existing/prospective customers in improving existing product designs and/or in developing other mature products. Seldom are they engaged in conceptual/industrial design, not to mention applied research in new technology. Even though the production function often receives much attention because sales expansion requires parallel expansion in production, it only submits to a subordinate role as its R&D counterpart does. In fact, these firms stick to non-dedicated equipment in order to be capable of shifting among a variety of electronics products, showing no interest in building a competitive edge in the production sphere itself. After all, these firms rely on sales and marketing strategies like product shift and business diversification, largely overlooking the production and research alternatives that could help alter their status as a follower in the rear.

Not surprisingly, the vast majority of these 30 sales-led subcontractors remain an OEM supplier in buyer-driven GCC despite operating at relatively large scale. Even though a few of them have turned into contract manufacturers for such electronics giants as Philips, Sharp and Sony, these better performers are still primarily engaged in low-margin, large-volume products, which those giants have totally or partially ceased producing in-house (see Appendix 1B for details). Sounds similar, doesn't it? The growth pattern of these sales-led subcontractors is just the mirror image of the upgrade trajectory of Hong Kong electronics industry -- growth without catch-up. Hence we approach a complete account of Hong Kong's peculiar upgrade trajectory

Power, Sharp Brave and Truly. See Appendix 1B for details.

by figuring out the organizational process by which their excellence in OEM develops hand in hand with inaction in industrial upgrading.

HANDICAPPED FIRMS IN TRUNCATED MARKET

The formation of sales-led subcontractors is rooted in the peculiar mode of industrialization in which the subcontracting network takes charge. With the founders keen on capturing growth opportunities across the subcontracting network, dealing with buyers is defined as the most critical task in these subcontractor firms. As a result, functional staffs that best serve this task -- sales and marketing staffs in most cases -- take the lead in strategic formulation, information processing and interdepartmental co-ordination. As it turns out, these subcontractors evolve around an organizational model that is set to excel in OEM at the expense of other possible tasks -- the sales-led subcontractor model.

Sales Orientation towards Truncated Market

Whereas the earlier industrial phase in Hong Kong saw most firms keen on making close contact with overseas buyers and local traders, the early 1980s also saw "a trend that makers nowadays prefer exporting direct to the buyers without going through trading companies" (*Electronics Components* 1982: 334). For example, Lai, who founded Fook Lung in 1982 after working in the electronics field for ten years, highlights securing buyers' orders as the most critical task during formation years:

"When I set up the firm, there was difficulty securing orders. At that time, the rule is to do sales through a middleman [i.e. through local trading houses] and we follow suit. But we later realize that it won't work in long term and set up our own marketing three years later ... My experience in the field eases my contact with some buyers such that I can short-list them and call them accordingly. Since then we have shifted our focus from doing business through trading houses to direct sales to overseas buyers."

As long as the founder defines dealing with buyers as the most critical task in an organization, the sales and marketing function gains power over others. It is not only evidenced in small firms like Fook Lung in which the entrepreneur is preoccupied with the sales function, but also in relatively large groups. Of the 30 sales-led subcontractors listed in the previous section, 12 of them have more than half of the executive directors with sales and marketing background⁹. As for the other 18 cases, either the top management formation shows no clear inclination towards any of the three functions, or the company is basically managed by family members (see Appendix 1B for details).

An illustrative case is True Light, a Hong Kong-based company with 10,000-strong total workforce in Guangdong Province of China. Even for this much larger firm which is organized in multidivisional form with much better integrated inter-departmental communication, it is executives with solid background in dealing with overseas buyers that take charge in each of the four divisions. The explanation given by Pang, managing director, illustrates how the sales and marketing orientation prevails in the organization:

"Business sense is the key asset in our group ... To survive, we have to capture the market trend to foresee best-selling products in years to come. Staffs who keep close contact with our customers are in the best position to do this, and so we have all of our division-in-charge with such experience ... They set the direction for the group just like what a captain does for a ship".

As a result of the dominance of sales orientation in strategic formulation, these firms lean towards business strategies that best suit the conception as well as the interest of the sales and marketing function, as for examples, market share expansion, product differentiation and market diversification. In fact, the overall inclination

⁹ These 12 firms are AV Concept, Daiwa Associate, Golden Power, Great Wall, Hanny, K&P, Kinson,

towards sales and marketing strategies in the electronics field not only emerged in the earlier phase of industrialization when getting buyer's orders constituted the primary source of growth opportunities, but also lasted throughout the restructuring era when other business possibilities have become abundant. Three surveys lend us strong support. First of all, Lin and Tuan (1989) find that diversification of production lines and product differentiation are the most popular strategies among local electronics firms, followed by diversification in overseas markets and developing new marketing channels. Secondly, Tuan and Ng (1995) discover that major business strategies of local electronics firms are "entering into new markets with existing products" (56%), "increasing market shares in existing markets" (44%), "developing new products for existing markets" (38%), and "developing new products for new markets" (31%). Finally, Federation of Hong Kong Industries, Industry and Research Division (1996) asks its members to list expansion plans in specific functional areas, and found that 52.2% of the respondents picking marketing, followed by product design and innovation (35.8%), research and development (32.8%) and general administration (11.9%).

The predominance of sales and marketing function in strategy formulation does not necessarily deter an industrial firm from industrial upgrading, but an orientation towards growth through getting more products sold in the OEM marketplace -- a truncated market -- does. With most firms directing their sales and marketing effort to lure organizational buyers, it is no surprise that Dataquest Inc. (1995) blames the weakness of Hong Kong electronics industry in both brand management and direct distribution to end-users:

"In general, manufacturers took a passive approach in the marketing of their products or services. About 30 percent of the companies interviewed

Leading Spirit, Orient Power, RJP, Tomorrow and Welback. See Appendix 1B for details.

mentioned that the marketing was mainly handled by their own overseas sales offices/agents. The other marketing means practiced by the manufacturers include advertising in trade magazines, participation in exhibitions, direct contact with customers, and customers' reference ... efforts spent in product market research and product marketing were minimal" (IV: 19-20).

An orientation towards strengthening presence in a truncated market explains a subcontractor's lack of initiative in going beyond the OEM system. The leading role of sales staffs in these firms just pushes them closer to the subcontractor role by building the organizational competence around buyers' needs, as in the case of True Light:

"Our marketing staffs serve as the primary collector of market information because of their close contact with our customers ... Usually, a new product development project is led by staff involved in business. After they formulate an idea or concept, they turn the project to the R&D team for further development".

Such a coordination routine -- hiring R&D engineers to execute those projects assigned to them by sales and marketing staffs -- blocks a subcontractor from capitalizing on business possibilities other than contract manufacturing. As long as such sales domination lasts, any attempt to go beyond the existing operation is unlikely because sales staffs who always eye on existing business opportunities in the OEM marketplace can never get a subcontractor out from its shell. Again, it is the case in True Light:

"I don't think Hong Kong firms are able to do any invention, nor are we. What we can do is just to utilize proven technology for new product design, or we improve existing products with cosmetic design and add-on features".

It is therefore no coincidence that True Light reports an upgrade trajectory within the systemic limit of contract manufacturing as many better-performing local firms do, transforming itself from a mere OEM supplier of simple consumer gadgets for mass merchandisers into an ODM partner with world-renowned brand holders for higher-

priced products. While these competent players in the OEM marketplace demonstrate impressive product upgrade by a careful selection of quality-conscious buyers, they seldom carve out a market niche on their own by in-house development of proprietary products, not to mention brand management and technology catch-up.

Structural Inertia in Sales-led Organizations

While an orientation towards more sales in the OEM marketplace deprives a subcontractor firm of the motivation to go beyond the subcontractor role, organizational practices that are so designed as to excel in the subcontractor role make the firm ill-equipped for many other high value-added activities. To illustrate structural inertia of this type I provide evidence from a couple of cases that demonstrate how existing organizational practices constrain most upgrade moves, even if chief executives take strong initiative.

While a sales-led coordination routine may streamline the operation of an OEM supplier who aims to satisfy the needs of its customers, it inhibits in-house development of proprietary products. It is evidenced in the case of Innotech Ltd., a 500-worker firm which found its organizational competence accumulated during the OEM phase through 1985 to 1993 inapplicable in an attempt to introduce in-house developed products in 1993. As Lee, the founder of Innotech, discloses, what it takes to succeed in the OEM marketplace turns out to be so irrelevant to the business shift so that it had to build its R&D function from the ground up:

“We had to build our R&D team from scratch, starting with only a few engineers who each handle a project independently. Only after a few years we built up a hierarchical structure headed by a chief engineer who oversees all projects ... In due course our OEM customers offer us no help at all ... Actually, the operation is totally different from OEM business in that we launch our marketing only after we complete the product development”.

Not only is an incapable R&D function evidenced in a small firm like Innotech Ltd., but a listed group like Faith International also had similar experience in its business shift. Even though the group has since being established in 1978 grown into a leading calculator manufacturer in Hong Kong, long-standing organizational practices were found useless in its attempt to catch up in technology. Indeed its shift to LCD manufacture by the early 90s might be impossible without an organizational restructuring, according to director Fong:

“The calculator business requires no R&D at all, and we hire designers to carry out cosmetic designs suggested by marketing staff after communications with customers. But it is totally different for the LCD line. Our R&D management team in Hong Kong is fully in charge of development projects under supervision of top management. They are active in absorbing technology through various channels like overseas visits and direct communications with suppliers”.

To add all up, sales-led coordination that facilitates fast success in the subcontractor role turns out to constrain both product development and technology catch-up. A shift away from the OEM role therefore requires a sales-led subcontractor to exercise organizational restructuring through major reallocation of resources. Unless power holders in the firm perceive a crisis in their business and take strong initiative, any systematic transformation away from their existing operation is not likely, as Fong explains in the case of Faith International’s move to LCD production:

“OEM is a just dead-end road ... A turn to higher technology requires management to endure... we have to sacrifice short-term profit for long-term growth. We are quite lucky to be backed by the calculator business, but the STN LCD line would need more time to benefit the group.”

Still, the structural inertia is so strong that failure is not improbable. In fact, the same year Innotech Ltd. started R&D on proprietary products, the company experienced the most serious business downturn in its history. Likewise, Faith International’s continuous investment in LCD was only made possible by extracting

resources from the calculator line that remained for years a stable source of profit. With high risks involved in such a big move, it is no surprise that few sales-led subcontractors take an initiative to do so. In the final analysis the path-dependent development of sales-led subcontractors is as much because of their attachment to OEM as their inability to capitalize on other business opportunities.

REINSTATING LOCAL DYNAMICS IN GLOBAL CONTINUITY

From now on we make more sense of the lack of industrial upgrading in Hong Kong electronics industry over decades. Whereas buyer-driven GCC recruited the vast majority of industrial entrepreneurs to the subcontractor role in the first place, structural inertia among these subcontractors helps maintain the status quo by making them reluctant to pull away from OEM business. But even if we may have shown how local dynamics play a part in stabilizing the global commodity chain, we have yet to figure out whether the insertion into buyer-driven GCCs paved the path-dependent development single-handedly. For this final question I seek to unearth in the next chapter alternative organizational forms with a view to show that Hong Kong's upgrade trajectory would have been different if the institutional context were not so structured as to foster the predominance of sale-led subcontractors.

CHAPTER FOUR

REINSTATING POSSIBILITIES FOR UPGRADE

If sales-led subcontractors are shy of going beyond labor-intensive OEM, it begs to ask why their predominance in the local electronics field has lasted for so long. Given abundant business opportunities in the restructuring era, Hong Kong could have significantly upgraded its industrial base by shifting to other global networks had there emerged alternative organizational forms. After all, these alternative forms have always been present, whose distinct business orientations pull them away from the vicious cycle of working in buyer-driven GCC, making them more likely to travel on a consistent upgrade trajectory by using alternative growth strategies. However, the proximate institutional context has always been less supportive, if not hostile, to these alternative organizational forms, depriving Hong Kong of a critical mass that could have made a difference in its upgrade performance in the restructuring era.

ALTERNATIVE ORGANIZATIONAL FORMS UNEARTHED

The subcontractor orientation has been so prevalent in Hong Kong industrial field for so long that we are often tempted to take it as a Chinese heritage.¹⁰ But a cultural argument barely gives a complete account, as there still exists obvious differences between Hong Kong and Taiwan in entrepreneurial orientation (see, for example, Chen 1995 for a differentiation between the “production orientation” in Taiwan and the “market orientation” in Hong Kong).

¹⁰ For example, Hamilton (1996) suggests the subcontractor mentality be rooted in what he calls “Chinese capitalism,” a version of capitalism grounded in kinship principles. On one hand, it nurtures the formation of business networks flexible enough to give Chinese capitalists a comparative advantage in demand-responsive settings. On the other hand, these principles have no affinity with businesses requiring high overhead or large factories. Hong Kong, a legendary center of Chinese capitalism, is organized around this orientation: “Hong Kong entrepreneurs let the market pull products. Networks of all firms hunted for and then responded to that market demand” (Hamilton 1997: p.21).

Table 4.1: Alternative Success Models in Hong Kong electronics industry

Companies	Major Outlets during Formation Years	Constituent of Success
Champion Technology	PTT in China	Invention of the first Chinese-language pager and paging system
Chen Hsong	Industrial Market in Hong Kong	Concentration on the design and manufacture of plastic injection molding machines of “Japanese quality at PRC cost”
Group Sense	Retail Market in Hong Kong	Invention of the first MPU-built electronic dictionary unit, marketed under the “Instinct Dict” brand.
Johnson Electric	Industrial Market in Hong Kong	Concentration on the design and manufacture of micro motors through intensive research in engineering
QPL	Industrial Market in the Asia Pacific region	Intensive investment in technology catch-up in lead-frame manufacturing and IC assembly
S.Megga	OEM for AT&T of the US	In-house development of Hong Kong’s first cordless phones
Varitronix	Industrial Market in Hong Kong	Concentration on the LCD marketplace through intensive research in technical know-how
V-Tech	Retail Market in US	Relying on its specialization in MPU design to turn out brand-new products like educational toys and cordless phones, sold directly in retail markets under house brands

Sources: Company IPO documents, Annual Reports, Newspaper Reports.

In contrast to the sales-led subcontractor model whose founders have been embedded in the subcontracting network, the alternative model has their founders detached from the market domain (Table 4.1; see Appendix 1C for more details). In fact, five of these eight firms have their founders being trained as engineers: Champion, Group Sense, QPL, S.Megga and V-Tech. As for the remainders, the founder of Chen Hsong was a mechanics, and the co-founders of Varitronix were both Ph.D. in Physics. Whereas Johnson Electric was founded by a salesman in the late 1950s, the son of the founder -- the company chairman at present -- has joined the top management since getting a university degree in mechanical engineering in early 1970s. From the outset, these firms have detached from buyer-driven GCC by starting their business either as an inventor of a proprietary product or an expert in a specific technology. For examples, before Champion Technology invented its Chinese-language paging system, Group

Sense applied the MPU technology to its electronic translator, and V-Tech launched the educational computer, there were no such products on the market. Likewise, while such items as micro motors (in the case of Johnson Electric), liquid crystal display (Varitronix) and lead frames (QPL) are widely available, the three companies has been an expert in their respective fields.

Ironically, while these eight firms could not benefit from the institutionalized subcontracting network in the local industrial field, their isolation from the buyer-driven GCC also pulled them away from the vicious cycle of working in the truncated market. As a result, either do they take the driver seat to carve out a market niche of their own, or they take part in other global networks that are more supportive to industrial upgrading. For examples, Champion Technology, Group Sense and V-Tech each have established distribution channels for own-brand products. Likewise, Chen Hsong, Johnson Electric and Varitronix each have made use of their technical expertise to serve both local and global industrial markets, whereas QPL and S.Megga have each built a foothold in producer-driven GCC in which continuous upgrading is an imperative.

As a result of their alternative connection to the global economy, they are better posited to travel on a consistent upgrade trajectory than the vast majority of Hong Kong electronics firms. Upon the precondition that isolation from the buyer-driven GCC opens up more upgrade opportunities, the outstanding upgrade performance of these eight firms points to the centrality of business orientations along with organizing strategies. Cases like V-tech and Varitronix show how a technology-based firm is built around the research orientation, whereas cases like Johnson Electric and Chen Chong show how a first-rate manufacturer is built upon the production orientation.

Technology-based Firms with Research Orientation

Whereas the fast lane to success in buyer-driven GCC increases the likelihood of those who are embedded in the subcontractor network to start up an industrial firm, a minority of industrial entrepreneurs did come from the technology domain to found research-driven firms in Hong Kong. In line with their detachment from the buyer-driven GCC, they are not to take successful dealing with overseas buyers as the most critical organizational task. Instead, they lean towards building an edge in specific technological areas by putting most organizational resources in the R&D function. As it turns out, their firms evolve around the research-driven model, which is set to carve out a niche in the global market through intensive R&D on proprietary technology.

Active Assertion to the Global Economy

In contrast to sales-led subcontractors that are often started by experienced practitioners within the subcontracting network, research-driven firms are usually founded by those trained in the technology domain. With their detachment from buyer-driven GCC comes their assertion into a well-defined market niche in the global economy. Indeed Varitronix was founded in 1978 jointly by two former university lecturers in Physics with a view to tap into booming demand for LCD applications, whereas V-tech were founded by two electronic engineers in 1976 for the purpose of manufacturing first-generation home video games. As a result of their isolation from the subcontracting network, these research-driven firms had to build their own distribution channels early in their corporate history: V-Tech set up its first overseas sales office in US in 1982, and Varitronix established its first in US in 1983. That helped both firms to get rid of the vicious cycle of working in a truncated market, permitting them to accumulate reputation among end users of their products.

Organizational competence built around the research function

But their emergence as one of the world's renowned technology-based firms has much less to do with a high autonomy in the distribution end than with a strong research orientation. In contrast to sales-led subcontractors whose growth hinges on selling more products through strengthening market presence, research-driven firms are characterized by a focus on the R&D function. After all, Varitronix excels on industrial market through in-house development of technological know-how on LCD production, whereas V-Tech builds an edge in consumer market by continuous product development on the basis of proprietary technology.

The fact that the founders of both V-Tech and Varitronix remain integral to R&D activities illustrates the centrality of the research function in each firm, whereas the allocation of organizational resources in favor of the R&D function further distinguishes their organizational competence from that of their sales-led counterparts. As for examples, Varitronix devotes 7-8% of its annual turnover to R&D throughout its history, and R&D expenditure of V-Tech amounted to US\$24 million in fiscal year 1996. As V-Tech's founder and CEO Allan Wong puts:

“Our emphasis on R&D is the key to success. You can get short-term growth if you underbid your competitors with lower prices. Long-term success comes from providing as innovative and high-quality product at a reasonable price” (quoted in *South China Morning Post* July 25, 1994).

Not surprisingly, corporate growth of a research-driven firm often revolves around R&D expertise in a well-defined technology area. In fact, the design expertise on single-chip microprocessor has long constituted a core competitive edge for V-Tech, permitting it to turn out proprietary products like computer educational toys and high-frequency cordless phones. Likewise, the top management of Varitronix calls itself “engineering boutique,” referring to the capability of offering total solution for custom-designed LCD applications on the basis of technical know-how developed

in-house. In the words of the founder C.C. Chang:

“We do not just acquire a technology and then mass produce it. We are rather like an engineering boutique: we devise technologies for whatever specific requirements you have” (quoted in *South China Morning Post* December 26, 1994).

A powerful R&D function in organization

Around this distinct business orientation a research-driven organizational form is built. In contrast to a sales-led subcontractor in which sales staffs often gain more power over other functional staffs, a research-driven model has an inter-departmental power structure more favorable to R&D personnel. It is evidenced in both V-Tech and Varitronix that an overwhelming majority of the top management comes from the technology domain. When V-Tech was listed on HKSE in 1992, four of the five executive directors were trained as engineers, whereas all six executive directors of Varitronix hold higher degrees in either science or engineering disciplines. With the top management remaining integral to R&D activities, the R&D function often gains a strong presence in the organization. In the case of V-Tech whose R&D workforce now exceeds 700 people, its first offshore R&D center was established in North America as early as in 1987, followed by the second one in Guangdong Province of China in 1988 and the third one in the UK in 1991.

But what ultimately distinguishes a research-driven firm from a sales-led subcontractor is rather the autonomous working of its R&D function than the size of its R&D team (as a handful of sales-led subcontractors also have a sizable R&D team). According to Allan Wong, the working of its R&D function now forms a technical triangle (*Hong Kong Economics Times* June 19, 1996). Overseas research centers are for information collection as well as research in technology forefront, while headquarters in Hong Kong take up a co-ordination role, with the research center in

China responsible for turning technological know-how into production.

We also find strong support from the case of Varitronix, whose R&D staffs may even be fewer than many sales-led subcontractors. A sales-led coordination routine just does not work for an orientation to build an edge in the technology race, as Varitronix's founder say in our interview:

“The top management takes a vital role in co-ordination. R&D staffs seldom consider commercialization before taking up a research project, whereas sales staffs tend to focus either on promoting existing products or on conceptualizing new products without considering technical feasibility. That is why the final decision on the research direction goes to the board, which is consisted of directors with both technical expertise and commercial sense”.

From now on we better understand why research-driven firms often outperform their sales-led counterparts in spite of their marginality in the local industrial field. Established by founders with a growth orientation different from the prevalent subcontractor model, research-driven firms have from the outset set themselves apart from the majority by giving up the fast lane to success in the buyer-driven GCC. Instead, they strive to carve out a niche in the global market through continuous R&D effort in a specific technology. Not only does the building of a capable R&D team ranks among top priorities in various organizational tasks, but the co-ordination routines are also so designed as to facilitate its R&D function to accumulate expertise in a specific technology area. Thanks to their technological competence research-driven firms are better posited than sales-led subcontractor to travel on a constant upgrade trajectory during the restructuring era.

Forerunning Manufacturer with Production-Centered Orientation

Not only can a sales-led subcontractor hardly accumulate technological competence because its R&D activities revolve around the need of its buyers instead of a specific

technology area, but its subcontractor role also implies its non-commitment to any specific product line. However, it is those who concentrate on a specialized product that stand a chance in becoming a first-rate manufacturer by virtue of their commitment to perfecting the production sphere. As in the case of research-driven firms, production-centered firms benefit from their detachment from the buyer-driven GCC. In line with their concentration on a specific product, the top-ranked organizational task goes to improvement in cost effectiveness through continuous process upgrade. As a result, they grow around an organizational form in which the production function takes the lead in corporate development.

Concentration on specialized product

In contrast to a sales-led subcontractor whose attachment to buyer-driven GCC inhibits product specialization, a production-centered manufacturer is characterized by its commitment to a single product. With practitioners of the subcontractor model unlikely to set up a single-product firm, the production-centered model recruited only a minority of industrial entrepreneurs whose commitment to the perfection of a product is often resulted from their past experience in the production domain. A vivid example in the Hong Kong's industrial field is Chen Hsong, whose founder is a mechanics that personally took part in designing the group's first-generation plastic molding machine in the late 50s. Throughout the past three decades, the group just concentrated on the manufacture of plastic molding machines on the basis of its corporate motto: "Japanese quality at PRC cost".

Another case in point is Johnson Electric, whose specialization in micro motors for four decades has earned it a leader status in various applications like household appliances and automobiles. Whereas the rise of both groups amid burgeoning

demand from local industrialists set their early success apart from the majority whose prosperity came from more orders from overseas buyers, their single-product policy is made possible only by a relentless pursuit for efficiency over decades. After all, the production-centered model is so called because the production sphere is where the organizational competence originates.

Organizational competence built around the production sphere

In line with an orientation towards cost effectiveness, a production-centered firm directs much of its strategic investments towards the production sphere. While sales-led subcontractors may also invest heavily on production facilities, production-centered manufacturers distinguished themselves by continuous upgrade in production facilities dedicated for a single product. In fact, Johnson Electric pioneered the use of purpose-built microprocessor-based manufacturing system in the local industrial field in the early 80s. As its IPO document gives an account:

“To support its commitment to high quality at low cost, modern plant and machinery with a total cost of approximately \$22 million was installed in the Company’s factories during the year ended 31st March 1984 and machinery and equipment costing approximate \$50 million is expected to be installed in the current financial year... Much of the Company’s automation equipment is specially designed and fabricated by its own manufacturing systems department which also undertakes research and development directed towards designing and improving the manufacturing processes and production techniques employed by the company” (p.11).

While one may wonder if industry-specific characteristics explain allocation of organizational resources like this, we are assured of the centrality of business orientation by the case of Chen Hsong, who went automation throughout the 1980s when other local manufacturers of molding machines chose production relocation. Just as a chief executive explains to me how a drive for manufacturing excellence

governs its growth trajectory during our interview:

“We are the first in our field in Hong Kong to employ computerized lathes in the manufacturing process ... Indeed increasing automation has since the early 80s been our group’s emphasis because of our inclination towards high-precision production. We never intend to lead the market in technology, but instead, cost and quality are always key to our leadership in the low-end to mid-range market”.

Functional integration in the production sphere

Thanks to their first-rate manufacturing capability, both Johnson Electric and Chen Hsong have already built a strong foothold in their respective field. Underlying their manufacturing excellence is a functional integration centered on the efficiency orientation that ultimately sets their organizational development apart from the majority. Indeed the R&D function often works so closely with its production counterparts that research activity gears more towards the production sphere than the technology domain. The case of Johnson Electric illustrates how such production-engineering integration works in the direction towards manufacturing excellence, as its IPO discloses:

“The number of employees who were primarily engaged in research and development activities as at 31st May, 1984, including those engaged in development of the Company’s automation equipment and production processes was approximately 140, of whom approximately 100 were engineers and technicians, the remainder being craftsmen and tool makers. Such activities concentrate on the improvements in materials, development in machine tools, innovations in production methods, automation, and improvements in efficiency and performance of the micromotors” (p.14).

This certainly is not to say that the R&D function does not engage in development in new product or advanced technology. It does, just to show a greater concern on achievement of cost efficiency through engineering sophistication. Again, the IPO of Johnson Electric is illuminating:

“Research concerning the efficiency and performance of micromotors is undertaken by an advanced engineering laboratory ... The product research and development department is also engaged in research concerning the

materials and components used in its micromotors ... The use of improved materials and computer-aided design equipment and techniques has made significant contributions to the cost, reliability and efficiency of Johnson micromotors” (p.14).

The centrality of the production function is also manifested in the marketing end. In contrast to a sales-led subcontractor in which sales staffs take the lead in the organization through their monopolization of market information, the marketing function of a production-centered manufacturer often involves its engineering staffs, who are themselves integrated with the production function. As a chief executive in Chen Hsong discusses the indispensable role of production and engineering staffs in marketing during interview:

“The top management encourages us to collect feedback directly from end users of our machines through visiting their factories. The production and design departments take such an active role because sales staffs usually lack the background to process technical information.”

This is why a production-centered firm outpaces a sales-led subcontractor in accumulating manufacturing expertise despite their minority status in the local industrial field. Originated in an orientation to outperform other competitors in cost effectiveness, a production-centered manufacturer is so built as to achieve continuous process upgrade for a specialized product. As a result, they are set to travel on a development trajectory different from that of sales-led subcontractors, whose attachment to the buyer-driven GCC comes with an imperative to organize its production function flexibly enough for buyer’s orders.

THE INSTITUTIONAL EFFECT REINSTATED

The contrast among sales-led subcontractors, research-driven specialists and production-centered manufacturers by no means lead us to judge which one is optimal. On the contrary, persistent diversity in business orientations in the electronics field

stops us from taking the subcontractor model as a rational choice or cultural heritage. Neither does the size argument work any better; the fact that all companies in the data set have grown from a relatively humble to a well-established scale in their course to public listing makes a perfect control of the size effect on strategic choice. However, the predominance of sales-led subcontractors in the data set does confirm my contention that the subcontractor model is more likely than its production-centered and research-driven counterparts to lead to corporate success in Hong Kong.

But this situation is puzzling once we bear in mind the global restructuring in the 1980s that should have provided research-driven and/or production-centered firms with ample business opportunities. To make sense of the persistent shortage of alternative organizational forms in Hong Kong industrial field, we had better take a closer look at the institutional environment on which industrial firms consistently draw resources for strategy formulation. While much have been said on the institutional configuration of Hong Kong's path-dependent development (Chiu et al. 1997; see also Berger and Lester 1997), I turn to examine how proximate institutions help maintain the status quo by creating a resource differential in the organizational ecology. As we are about to see, even in Hong Kong where the industrial sector as a whole faces a less supportive environment, sales-led subcontractors are still more likely to become beneficiaries than their research-driven and production-centered counterparts whenever institutional support is available.

Government support for industry

Astonishing as it may sound, government policy sustains the status quo in the organizational ecology more because of its selective intervention into the industrial field than its adherence to the free-market doctrine. While the government has long

been renowned for refraining from designing an industrial policy to alter the pace, direction and pattern of industrial development, it nonetheless had an industrial policy of some kind. But unlike other Asian NIEs that follow a “top-down” approach to “pick winners,” Hong Kong government uphold a “bottom-up” approach that concentrates on removing obstacles to industrial and commercial investment (Tsui-Auch 1998). As a result, sales-led subcontractors – “winners” on the “free-market” - - often become primary beneficiaries of industrial policy in Hong Kong, further depriving research-driven and production-centered firms of their chance in challenging the majority status.

To look back, the government had often been responsive to the immediate needs of the majority in the manufacturing field. In the earlier phase, the predominance of trading-mediated manufacturing activities followed that “certification of origin, participation in trade fairs, and trade publications more or less exhausted what the colonial state did to selectively promote industrial growth” (Chiu et al. 1995: 115). Likewise, the vast success of export-oriented manufacturing through the 1970s to 1980s paralleled a support system that evolved around the spheres of market promotion, trade facilitation and infrastructure provision (Sit and Wong 1989). With the late 1980s to 1990s witnessing massive relocation of manufacturing activities, its emphasis shifted to the facilitation of entrepot trade with China (Chiu et al. 1997).

Not surprisingly, sales-led subcontractors benefited from their majority status in the industrial field to win public support. Indeed there is an affinity between the subcontractor model and the most prominent organization within the public support system -- Trade Development Council (TDC), whose primary goal is to promote Hong Kong export trade. By contrast, alternative models find their needs low on the priority list of policy makers, a notable example being the lack of support for

product/technology research and engineering-related activities (Berger and Lester 1997). Not until 1985 did the government grant \$8 million to establish the Hong Kong Design Innovation Company Ltd. to provide the industry with product innovation and design services, and only after the early 1990s were a handful of funding schemes set up to support technology-related projects (Director of Audit 1997). Calls for a science park and a NASDAQ-type second board even lasted for more than a decade before the government took them into serious consideration in the mid-90s.

All in all, local industrial policy helped sustain the status quo instead of stimulating systematic transformation in the industrial field. It is as much because of its failure in pushing the majority to re-orient their growth pattern as its lack of selective incentive for alternative organizational models to start up. Not surprisingly, the colonial government set up a high-profile Committee on Diversification in 1977 to address concerns about industrial upgrading, only to leave many of the issues signaled at that time unresolved today (Berger and Lester 1997).

Capital market

Believe it or not, Hong Kong's industrialists seldom find an easy access to financial sources in local capital market, whatever banks, venture capitals or stock markets are in your mind (Berger and Lester 1997). On one hand, the "institutional separation of industry and finance" hindered upgrading strategies that require long-term, heavy capital investment (Chiu et al. 1997). On the other, the fact that trade credit has long been a major source of external finance in the manufacturing industry helped maintain the balance of power in the field. After all, sales-led subcontractors are more likely to benefit from the prevalent financial arrangement, as Bernard and Hallward-Driemeier

cogently put it (1997):

"If start up firms do seek external finance, they usually approach banks and are extended trade credit. Such credit is short-term -- 90 days up to one year -- and is secured by the receipts of the company ... The implications of this short-term loan structure varies across activities. For a trading concern with cash flow from the outsets of operations, rolling over this type of short-term loan may be feasible, due to the incoming revenues, and beneficial, as the firm can vary its debt obligations on short notice. On the other hand, a start-up firm, in software development for example, trying to turn an idea into a new product line typically experienced a lack of revenues at the outset which essentially cuts off trade credit as a source of financing" (p.299).

That once again points to the advantages of being the majority; banks are more befriended with those who concentrate on contract manufacturing for overseas buyers. Indeed such a financial arrangement just fits in the work flow of sales-led subcontractors: they obtain necessary cash flow to maintain their operation after getting a confirmed order, and they just keep the cycle running by getting new orders after old ones are shipped. In contrast, for those who neither start nor operate their business upon confirmed orders, a research-driven firm for example, banks are unlikely to be a source of capital.

In a capital market where neither venture capital nor second board is available (Berger and Lester 1997; Chiu et al. 1997), start-up firms that intend to apply alternative business models in Hong Kong had better ensure quick return, or they risk running short of capital. Ironically, both research-driven and production-centered firms are far less likely than sales-led subcontractors to secure fast success in the institutionalized subcontracting network, which linked Hong Kong but to buyer-driven GCC. That is why I point out the capital market as another institutional force that sustains the predominance of sales-led subcontractors in Hong Kong.

Education system

With the government taking a prominent role in education, it is not surprising that the education system again created a resource differential in the industrial field. Just as its counterpart in industrial promotion, government policy in education and training consistently followed a “bottom-up” approach. The Advisory Committee on Diversification (1979) pinpoints the foundation on which the government formulated its policy on education and training during the 1970s:

“[I]t was the Government’s responsibility to provide education whilst restricting itself to facilitating training ... Industry must accept the full cost of providing this element of training, whether it be given in industrial premises or in training centres built and equipped for the purpose” (p.219-220).

In other words, the education system is never designed to stimulate systematic transformation in the economy, not to say the industrial sector. While the Hong Kong Productivity Centre was a prominent public body for industrial training during the 1970s, it just offered training courses mainly in the areas of production management and labor supervision in the earlier 1970s (Sit et al. 1979: 218). While the late 1970s saw the institution expanding its training courses in more specific fields like management and technology, just more than half of its training activities benefited the manufacturing industry, the rest being absorbed by non-manufacturing sectors (ibid.: 222). After all, the pledge to operate on a self-sustaining basis even pushed the institution to deviate from its aims and objectives, which is “to promote the increased productivity of industry in Hong Kong and to encourage the more efficient utilization of resources therein” (ibid : 227).

Even though the government took up a more active role in industry-specific training by setting up the Vocation Training Council in 1982, its approach remained more or less unchanged, resulting in a technical training system far too passive for any

systematic transformation. Throughout the 1980s the industrial training system is by large responsive to the immediate needs of prevailing activities, “emphasizing the operative, craftsman and technician levels of skills” (Sit and Wong 1989: 67). The tertiary institutions where technologist training level is done did no better than providing general training for the business community as a whole. Indeed a common complaint among Hong Kong industrialists is that "the universities hold themselves aloof from the industrial sector and do not tailor their teaching and research activities closely enough to its needs" (Berger and Lester 1997: 66). As a result, not only did the education system fail to supply personnel with a different perspective from the dominant business model, but it also results in a lack of collaborative research projects between universities and industries.

Such an education system has quite different implications for different organizational forms. For sales-led subcontractors whose primary business objective is to secure buyers' orders for low-margin, large-volume items, it may be good enough to have a steady supply of operatives and technicians from vocational schools together with administrative and business executives from universities. The shortage of experts in industrial engineering and applied research does not hurt, nor does the lack of collaborative research between universities and industries. But it is a totally different story for research-driven and production-centered firms; they find themselves in an environment where the absence of a critical mass engaged in technology-related research activities hinders their core activities. To add all this up, the education system poses another institutional force in sustaining the status quo by depriving alternative models of the supply of appropriate personnel.

Labor market

Of less significance among all four proximate institutions may be the labor market, in which we see much more facilitating force on the subcontractor model than constraining one on alternative models. After all, there is still an affinity between the subcontractor model, whose primary manpower concern is numerical flexibility, and the local labor market, in which job mobility is normally high (Chiu et al. 1997). By contrast, such flexible labor market arrangement hinders the growth of both production-centered and research-driven firms by making firm-specific training difficult.

The prevalence of sales-led subcontractors also benefit from a community-wide concern for low labor cost, with the industrial take-off going hand in hand with public subsidies in housing and medical service (Castells et al. 1990). The maintenance of low labor cost is such a legitimate concern that even when industrial competitiveness aroused wide concern in the 1980s, much attention revolved around importation of foreign labor (Tsui-Auch 1998). Not surprisingly, manufacturers who subsequently decided to relocate faced little resistance. While the weak union set them almost free from interference in devising that strategy (Chiu et al. 1997), the authority somehow regarded the relocation as optimal. Just as the Director-General of Industry (1993) put: “Hong Kong’s proximity to China has rendered it possible to take advantage of lower land and labor costs in China. The shifting of labor-intensive industries to China has resulted in a leaner industrial workforce here ... This has helped to lessen the cost of production, thus maintaining the competitiveness of Hong Kong products” (p.2).

HONG KONG’S UPGRADE FAILURE RECONSIDERED

Not until we unearth the alternative model in the organizational ecology do we give a

complete account of the lack of industrial upgrading in Hong Kong electronics industry. By referring only to the prevalent business model we unfortunately obscure alternative organizing strategies that make up such world's renowned firms as Johnson Electric, V-Tech and Varitronix. More anomalous still, we produce no idea as to why these alternative organizational forms never become a role model and attract others to follow. In the final analysis, the Hong Kong electronics industry has been locked into labor-intensive OEM only because the institutional context has so long fostered the predominance of the subcontractor model in the organizational ecology, inhibiting the emergence of a critical mass that could otherwise help pull Hong Kong away from buyer-driven GCC.

CHAPTER FIVE

SOCIAL SELECTION OF UPGRADE TRAJECTORY

This paper seeks to make sense of Hong Kong's underachievement in industrial upgrading over the past three decades. What we have gone through so far is somewhat contrary to the popular belief that Hong Kong is a free market where efficient allocation of resources at the economy level always go hand in hand with rational choice of business strategies at the firm level. With the business environment favoring those industrial entrepreneurs that are preoccupied with labor-intensive manufacturing for the international subcontracting network, resources in the industrial field are constantly allocated in a way that blocked Hong Kong from industrial upgrading. Of course, it could be counter argued that upgrade failure does not necessarily imply either irrational choice of growth strategies or inefficient allocation of resources. But in this concluding chapter I will strengthen my case with the help of financial data of publicly listed electronics firms by showing how the subcontractor model undermines sustainable growth even at the firm level. My contention is that the social-organizational approach outperforms the free-market thesis by virtue of demonstrating a concrete linkage among the global business environment, the local institutional context and firm strategies.

Beyond the Myth of the Free Market

For many free-market advocates, Hong Kong's exceptionally low level of state intervention into the market sets it apart from the other NIEs in the region. Among them Young (1994) even praises the territory's outstanding record in the growth of total factor productivity (TFP) in the region, highlighting its economic growth as the result of efficient use of resources – capital and labor – rather than continual pumping

of factors of production into the economy. But as far as international competitiveness is concerned, efficient use of resources carries much lesser weight than such concepts as "competitive advantage," "entry barrier" and "rent protection".

A case in point is the electronics industry in which capability to upgrade is vital for international competitiveness. Given Hong Kong's leader status in the region throughout the late 60s to mid-70s, its underachievement in industrial upgrading thereafter points to a situation that is hardly optimal. Despite its early lead, Hong Kong failed to keep up with the international race by moving towards high value-added activities amid the restructuring era, in which Singapore, South Korea and Taiwan each upgraded their local industrial bases in one way or another. Meanwhile, the overwhelming majority of electronics firms declined to capitalize on upgrade opportunities opened up in the global economy, only to continue their cost-based competition in the OEM marketplace by production relocation in Mainland China. Even though product upgrade of limited scale is recorded, neither process innovation nor technology catch-up has gone far enough to alter its status as a cost-based competitor in the international marketplace. As a result, the relative contribution of the industry to the local economy kept shrinking from the mid-80s onwards.

Still, massive relocation did help hundreds of Hong Kong-based industrial firms to regain a foothold in the OEM marketplace. This is why one may suggest that these firms should have made the best choice for themselves by preferring production relocation to industrial upgrading. But as long as we hold that optimal strategies should achieve sustainable growth, their reluctance to complement relocation with other upgrade strategies justifies my doubt on whether the subcontractor model is optimal. By making use of publicly available data of listed electronics firms in Hong Kong, we confirm that the dominant business model did no better than slowing the

downward spiral of Hong Kong's competitiveness in the international market.¹¹ In Table 5.1 to 5.3, I sum up the financial performances of the 53 listed electronics firms by grouping them in three groups in accordance with the classification scheme in previous chapters. Accordingly, there are 30 firms in the subcontractor model, 8 in the alternative model (i.e. those of research-driven or production-centered model), and 15 in the mixed model (i.e. those showing no clear strategic inclination).

Table 5.1: Growth in Sales Turnover of Various Business Models in Hong Kong Electronics Industry, 1990-96

Business Model	No. of firms	Sum of Annual Sales Turnover of All Firms in the Group, in HK\$ Million						
		1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97
Subcontractor Model	19	10287	13631 (32.5%)	17606 (29.2%)	20293 (15.3%)	25389 (25.1%)	26516 (4.4%)	27895 (5.2%)
Mixed Model	11	4985	5900 (18.4%)	7497 (27.1%)	8267 (10.3%)	10064 (21.7%)	12059 (19.8%)	12665 (5.0%)
Alternative Model	8	6397	8657 (35.3%)	10238 (18.3%)	10890 (6.4%)	13307 (22.2%)	15156 (13.9%)	16263 (7.3%)

Note: Figures in each bracket denote annual growth rate.

Source: Shih (ed.) various years.

The three groups show comparable growth in sales throughout a similar business cycle in the 1990s -- a boom in the early 90s followed by a relative slump in the mid-90s (Table 5.1). The subcontractor model even outgrew the other two in most years, probably because of a strong orientation towards more sales. However, the subcontractor model achieved that impressive growth only at the expense of profitability, falling far behind the other two models in both profit-to-sales and return-to-capital ratios (Table 5.2). In fact, the growth in sales parallels the considerable erosion in profit margin over the 1992-96 period, with the profit-to-sales ratio dropping below 3% and return-to-capital ratio standing at 1% in 1996. After all, the subcontractor model experienced a slump in net profit after reaching its peak in

¹¹ Their financial performances are compiled in a locally investment guide edited by Shih various years.

1994 (Table 5.3), confirming my contention that relocation but helps slow down the erosion of Hong Kong's competitive advantage over other cost-based competitors.

In compared to the subcontractor model that competes for market share regardless of narrowing profit margin, both the alternative and mixed models show much healthier financial performance. The alternative model that complements production relocation with other upgrade strategies has both profit-to-sales and return-to-capital ratios topping double-digits over the 1990-97 period, and the mixed model that is less reliant on OEM orders also consistently outperformed the subcontractor model in both respects (Table 5.2).

The subcontractor model's poor financial performance indeed corresponds to its vulnerable position within the buyer-driven GCC. In a comparison on profit stability over the 1990-97 period (Table 5.3), the subcontractor model shows the highest variation ratio (0.822), followed by the mixed model (0.553) and the alternative model (0.438). Such fluctuation in net profit makes sense, given its preoccupation with the international subcontracting network in which overseas buyers appropriate most economic rents. By contrast, the alternative model that is isolated from the buyer-driven GCC is assured of relatively stable business, and even the mixed model is less likely than the subcontractor model to be the loser in each economic downturn.

Table 5.2: Profitability of Various Business Models in Hong Kong Electronics Industry, 1990-96

Business Model	No. of firms	Profit to Sales (%)			Return to Capital (%)		
		1992	1994	1996	1992	1994	1996
Subcontractor Model	30	8.35	0.78	2.32	10.57	0.13	1.00
Mixed Model	15	11.35	9.58	3.85	8.79	6.13	2.50
Alternative Model	8	24.93	16.63	17.56	18.19	9.23	12.20

Source: Shih (ed.) various years.

Table 5.3: Profit Stability of Various Business Models in Hong Kong Electronics Industry, 1990-96

Business Model	No. of Firms	Sum of Annual Net Profits of All Firms in the Group (Million HK\$)							Index of Profit Stability		
		90-91	91-92	92-93	93-94	94-95	95-96	96-97	Standev	Mean	Variation Ratio*
Subcontractor Model	19	739	909	1256	1014	70	-120	502	513.00	624	0.822
Mixed Model	11	342	528	576	771	853	208	1009	338.49	612	0.553
Alternative Model	8	682	966	1114	1197	1294	1772	1312	521.40	1191	0.438

*Note: The variation ratio, a relative measure of variation, is the standard deviation divided by the arithmetic mean. This serves to take into account the units of measurement and the location of distribution (Loether and McTavish 1974).

Source: Shih (ed.), various years.

Industrial Organizations as Social Organizations

The above data show that the subcontractor model is hardly a set of optimal strategies in the restructuring era. On the one hand, the preference for relocation over upgrading helps the Hong Kong electronics industry only to delay the overall decline of international competitiveness amid the rise of other cost-based competitors. On the other hand, the preoccupation with OEM subcontracting undermines profit stability by putting them in the most vulnerable position across the global division of labor. It is therefore no coincidence that many subcontractor firms report a slump in profit, or even a loss, in the mid-90s, when material and component costs soared as a result of appreciation of Japanese Yen, and competition in the OEM market kept intensifying amid the rise of ASEAN member countries. So lacking in bargaining chips against overseas buyers are these sales-led subcontractors that they had few choices but to give up profit margins for sales volume. Otherwise, they put their survival on risk because their organizations are not equipped for capitalizing on other business opportunities. By submitting to the subcontractor role year after year sales-led subcontractors indeed undermine their own sustainable growth.

For those who embrace the rational-actor model, it has to be puzzling that the

majority of industrial entrepreneurs in Hong Kong adhere to the sales-led subcontractor model. But this paper seems to have found the missing piece by using the social-organizational approach instead. Rejecting the subcontractor model as a rational choice, this paper uncovers the dynamics of this business model by taking an industrial organization as a social organization. This is not to say that entrepreneurial choice is irrational, only to insist that rationality can only be "subjective" or "relative" in the sense that any rational choice is made with a frame of reference which is itself determined by the limitations of the rational man's knowledge.

By going beyond the notion of economic man I do not turn to the notion of cultural man. Rather, this paper looks into the ecological evolution in Hong Kong electronics field with a view to find the root of this subcontractor orientation in a historically specific institutional environment. After all, the rise of sales-led subcontractors is contingent upon the pre-existing trading network that inserted the local industrial field into the global economy through buyer-driven GCC. With a fast lane to success in the subcontracting network, it required little technical or business know-how for a subcontracting firm to get more products/service sold by seeking more buying orders. Under this peculiar mode of industrialization, those who had already been embedded in the international subcontracting network even benefited more than technical and managerial experts did. As a result, the subcontractor model outgrew other alternative models in the field by attracting hundreds of imitative newcomers and/or spin-off firms.

Whereas an insertion into the buyer-driven GCC recruited the overwhelming majority of local industrial entrepreneurs to the subcontractor role in the first place, structural inertia at the organizational level helps make these subcontractor firms stagnate in the OEM role. With the buyer-driven GCC not supportive to constant

upgrading on the part of local suppliers, local suppliers hardly have an incentive to upgrade their activities as long as they are preoccupied with the existing business arrangement. It is indeed the case in Hong Kong electronics field. The overwhelming majority of these sales-oriented entrepreneurs are so attached to the subcontracting network that they organize their firms around an organization form that is set to excel in the OEM role at the expense of other possible tasks. This path-dependent development helps explain why most local electronics firms failed to take the up-market route in the restructuring era. After all, they are so preoccupied with the OEM role that production relocation turns out to be the only available restructuring strategy for them to stay competitive in the subcontracting network.

Social Selection of Development Trajectory

By linking local dynamics to global continuity, this paper also hints at the mobility chances of a locality within a stratified global economy. The case of Hong Kong electronics industry points to the priority of getting into the right network, i.e. one that is more supportive to constant upgrading. The better the network a locality has got into, the better the chance its industrial entrepreneurs stand in upgrading their activities. But the global force stops here, giving way for the historical-institutional context that ultimately determines into which global links a locality is to get. The growth experience of Hong Kong electronics industry: while the industry stood a slim chance in industrial upgrading because of its decade-long linkage to buyer-driven GCC -- a global network that is not supportive to industrial upgrading, there is still much room for maneuver. Had the local institutional context stimulated the emergence of alternative models, the organizational ecology might have seen a critical mass that could have connected the field to other global networks, making a

difference in its upgrade trajectory during the restructuring era.

To sum up, the path to industrial upgrading is more a result of social selection than market competition. Whereas legacy helps pick the industrializing agent in early industrialization, policy helps direct the development trajectory by approving the prevalence of a given business model. But at each turning point, each society still has a chance to make a difference in its positioning in the global economy by selecting another group of agents along with another business model. This is to say that the rise and fall of these competing business models depends upon the interplay between the global business environment and the local historical-institutional context. In the final analysis, there is no such thing as rational actors choosing optimal strategies in a free market, but only social actors doing the best with their tool-kits in a historically specific institutional environment. If this is what is always meant by market competition, I cannot agree more. If not, let us face the reality that we barely understand how the market works until we take it as a socially constituted process.

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Appendix 1: Data Set on the 53 Electronics Companies Listing on the Hong Kong Stock Exchange.

The major contention in this paper is that Hong Kong's peculiar upgrade trajectory in its electronics industry is a result of the persistent dominance of an organizational form in the industrial field. To look into the organizational ecology, I trace the growth trajectory of practically all publicly listed electronics firms in order to see which set of business strategies constitute its success, as defined by listing on HKSE. While the coding is subject to my judgment on qualitative data that include IPO (initial public offering) documents, annual reports, newspaper reports and/or articles in books and journals, the coding scheme is nonetheless systematic, as listed below.

A. Coding Scheme of Key Variables

Founder Background – coded by following the founder's work experience prior to starting the firm

- Market Domain – those with sales & marketing experience and/or those from a trading background; and those embedded in the buyer-driven, trader-mediated subcontracting network;
- Technology Domain – those trained in engineering, science and/or other technological disciplines;
- Production Domain – those closely involved in the production process, e.g. industrial engineers, craftsmen and factory manager.

Business Claim -- coded by seeing how the firm makes sense of its success, as expressed by Chairman/Managing Director in IPO documents, annual reports and/or newspaper reports.

- Research Claim – constant research and ceaseless innovation;
- Selling Claim – getting more products and/or services sold;
- Efficiency Claim – streamline the production for cost effectiveness.

Business Orientation – coded by identifying the priority of business strategies at each company (usually evident during formation years, as well as under critical situations like planning for further expansion and finding solutions for business downturn)

- Research-driven – product innovation; intensive R&D; in-house development on proprietary product and/or technology;
- Sales-oriented – market diversification; product shift; production expansion; product diversification; business diversification; brand building; expanding distribution channel;
- Production-centered – vertical integration; automation; equipment/fix capital input; industrial engineering; material control; quality control;

Top Management Formation – coded by looking into the composition of the board of executive directors

- Sales-led – with sales & marketing staff over-represented in the board of directors as well as in the top management team
- Production – with production staff over-represented in the board of directors as well as in the top management team
- R&D-driven – with R&D staff over-represented in the board of directors as well as in the top management team
- Others, such as family management or a balanced background.

Competitive Performance – coded by seeing how the firm ends up doing by 1996.

- Rear follower – concentrating on the lower end of the market by low-margin, large-volume production;
- Competent OEM – serving world's leading OEM by distinguished manufacturing capability;
- Niche Player – competing on a well-defined market niche not readily occupied by other competitors;
- Segment/Niche Leader – head-on competition with world's leaders in a specific product line or market segment;

B. The Subcontractor Model

Company	Founder Background	Business Claim	Business Orientation	Top Management Formation	Competitive Performance	Major Source of Order in Formation Years	Year of Start -up	Year of IPO
Alco	N/A	A strong Efficiency Claim , stressing its vertically integrated production capability.	Production-centered strategies take the lead, e.g. vertical integration, quality control and investment in machinery. Research-driven strategies follow, as the group later also stresses product development.	Directors are recruited from rather diverse backgrounds, indicating a balanced top management.	Competent Competitor , concentrating on ODM and OEM of home audio products for world's leaders, including AIWA, TEAC, Philips and Thomson.	Export to US Buyers	1968	1993
AV Concept	Market domain, the chairman worked in the sales and marketing position for years before forming the group.	Selling Claim , highlighting the business relationship with its supplier and its customers.	Sales-oriented strategies dominant, as the group stresses its distributorship and the strengthening of its sales and marketing network.	The founder still leads the top management, with the majority coming from the sales and marketing function .	Rear Follower , concentrating on the distribution of electronics components of Samsung in the Hong Kong and China markets.	Distributorship in Hong Kong	1980	1996
Daiwa Associate	Founded as a two partners, with the chairman from the market domain -- a trader in the electronics field.	A strong Selling Claim , as the IPO highlights its "one-stop purchasing" service (purchases other electronic components for re-sale to customers). into new markets, signing new distributorships and product shift.	Sales-oriented strategies dominate, as illustrated by vast effort in business diversification over the years through penetration into new markets, signing new distributorships and product shift.	The Board of Directors are dominated by those with a sales and marketing experience	Rear Follower , concentrating on the manufacture of low-end basic components and distributorship for the world's leading component makers	Manufacturers in Hong Kong	1985	1994

Golden Power	<p>The chairman was Selling Claim, as the group highlights the major in chemical engineering -- the established customer technology domain.</p>	<p>Sales-oriented strategies top the list, with distribution network building, business diversification, and customer base ranked high.</p>	<p>The majority of the executive directors are from the sales and marketing function</p>	<p>Rear Follower, concentrating for the manufacture of matured products like batteries, electronic games and other electronic components</p>	<p>1972 1993</p>
Great Wall	<p>The chairman founded the company as a trading house -- the market domain; and the successor, a marketing expert -- also from the market domain.</p>	<p>Sales-oriented strategies take the lead, including business diversification, market expansion and product shift.</p>	<p>The overwhelming majority of the executive directors are experienced in sales & marketing.</p>	<p>Rear Follower, the company mainly engaged in matured products, with an edge in its early penetration into the China market.</p>	<p>1982 1991</p>
Hanny	<p>Founded as a trading firm, the founders are originated from the market domain.</p>	<p>Sales-oriented, as the group stresses multiple brands to cover different market segments and price levels, as well as distribution network building and business diversification.</p>	<p>The executive directors are dominated by those from the sales and marketing function</p>	<p>Once a Niche Player, Export to US competing on the world's market of magnetic storage media with its house brand "Dysan"; but later ran into a financial crisis due to operational loss after a merger.</p>	<p>1971 1991</p>

<p>Hanwah N/A</p> <p>A fairly strong Selling claim, as the group highlights its broad customer base and its good working relationships with customers.</p>	<p>Sales-oriented strategies top the list, with business diversification into related products whenever market opportunities are detected ranking high.</p>	<p>The combination of executive directors shows no inclination towards any of the three functions</p>	<p>Buyers in US and China</p> <p>1983 1991</p>
<p>Honko International Started as a trader, the founder is originated from the market domain</p>	<p>Sales-oriented strategies dominate --initially engaging in trading of electronic components and later diversifying into the manufacture of simple semiconductor devices after market leaders like National Semiconductor shifted away.</p>	<p>The executive directors are recruited mainly from the family, without a clear inclination towards any of the three functions</p>	<p>Rear Follower, concentrating on the distribution and manufacture of simple components like diodes and transistors</p> <p>Manufacturers in Hong Kong</p> <p>N/A 1996</p>
<p>K&P A trader at first, the founder-co-chairman is from the market domain</p>	<p>Sales-oriented strategies dominate, emphasizing on business diversification in response to market demand. Production-centered strategies follow, such as advancement in equipment and vertical integration.</p>	<p>Executive directors are mainly recruited from the sales and marketing function</p>	<p>Rear Follower, concentrating on the manufacture of silicon rubber keypad (a basic component), calculators, alarm clocks and plastic products.</p> <p>Manufacturers in Hong Kong</p> <p>1985 1996</p>

<p>Kinson</p> <p>A production worker before starting his own petty workshop to serve the subcontracting network – Market Domain.</p>	<p>Selling claim, the group highlights its assessment of market trends.</p> <p>Sales-oriented strategies dominate, emphasizing on business diversification in response to market demand.</p> <p>Executive directors are mainly recruited from the sale and marketing function.</p>	<p>Rear Follower, concentrating on OEM of rather low-end consumer products.</p> <p>Sales to overseas importers</p> <p>1981 1988</p>
<p>Kong Wah</p> <p>Market Domain — founded as a partnership by two former executives in other electronics firms -- one a former marketing manager, and the other, production manager.</p>	<p>Research claim, the chairman highlights the group's effort in product development, and its own market research team in collecting market information.</p> <p>Sales-oriented strategies couple with research-driven strategies to develop new products in response for proven market demand.</p> <p>The executive directors form a rather balanced combination, showing no inclination towards the three functions.</p>	<p>Competent Competitor, being the largest HK-based TV manufacturer who held the "Konka" and "Onwa" brands, in addition to supplying to OEM customers like RCA, Akai, Daewoo, General Electric, before it merged with Akai in 1995.</p> <p>Relying one or two buyers in the US</p> <p>1979 1992</p>
<p>Kosonic</p> <p>Before setting up the firm, the chairman worked in a trading firm, i.e., from the market domain.</p>	<p>A fairly strong efficiency claim, as the group highlights vertical integration and a strong commitment to product quality as key factors to success.</p> <p>Sales-oriented strategies take the lead, with product diversification topping the list. Production-centered strategies follow, with vertical integration and quality control being the group's focus.</p> <p>Executive directors are recruited mainly from the family, without a clear inclination towards any of the three functions.</p>	<p>Rear Follower, concentrating on OEM/ODM of audio products for overseas importer/private label holders.</p> <p>Sales to overseas importers through their buying offices in Hong Kong</p> <p>1984 1993</p>

<p>Leading Spirit</p> <p>Before starting the firm, the chairman was a factory manager in China, but he started the firm as a trading house, i.e., from the market domain.</p>	<p>A Strong Selling Claim, Sales-oriented strategies</p> <p>dominate, as the group stresses business diversification and distribution network building.</p> <p>Half of the executive directors are involved in sales and marketing function.</p> <p>concentrating on non-exclusive distributorship of consumer electronics and components in China; late also diversified into the assembly consumer electronics.</p>	<p>1987 1993</p> <p>Manufac-turers in PRC</p>
<p>Luks</p> <p>The chairman started the group as a plastic-injection molding and metal stamping workshop in mid-70s to serve the subcontracting network – Market Domain.</p>	<p>Selling claim, the chairman highlights his assessment of market trends.</p> <p>Sales-oriented strategies</p> <p>dominate, the group taps into the growth opportunities by making product shift, market diversification as well as diversification into unrelated business</p> <p>The top management is largely dominated by the founder's family, but with no clear inclination towards any of the three functions.</p> <p>Once a Niche Player</p> <p>concentrating on the manufacture of TV for China market, the group has lately emerged to be less like an industrial group due to massive diversification into unrelated business.</p>	<p>1975 1986</p> <p>Sold in China</p>
<p>Man Yue</p> <p>Started as a trader, the founder is originated from the market domain.</p>	<p>Selling claim, as the group highlights its ability to make response to market demand and its intention to broaden the customer base..</p> <p>Sales oriented strategies</p> <p>take the lead, as shown by the diversification into manufacture through merger, as well as the effort in broadening its customer base. Production-centered strategies follow, as shown by advancement in equipment.</p> <p>The combination of executive directors shows no inclination towards any of the three functions.</p>	<p>1979 1997</p> <p>Manufac-turers in Hong Kong</p>

<p>Ngai Lik Started as a small workshop in mid-70s to serve the subcontracting network --the Market domain. Before that he was a production worker in an electronics firm.</p>	<p>Selling claim, stressing on its wide customer base and its knowledge on the market.</p> <p>Sales-oriented strategies take the lead, with product shift to cater for market changes and business diversification topping the list. Followed by production-centered strategies, including vertical integration.</p> <p>Family members dominate the top management, but the combination of executive directors shows no clear inclination towards the three functions.</p>	<p>1976 1992</p> <p>sold to US buyer through trading agents in Hong Kong</p>
<p>Founded by two partners, both formerly engaged in the management of a local electronics firm – Market Domain.</p>	<p>Selling claim, stressing seeking growth opportunities through new product developments on proven market demand.</p> <p>Sales-oriented strategies take the lead, product diversification into secured market topping the list. Research-driven strategies follow, stressing on seeking growth opportunities through new product developments.</p> <p>Organized in a multidivisional structure, the group has each of the division head from the sales and marketing function.</p>	<p>1984 1991</p> <p>Sales to overseas (mainly US) buyers and through local trading agents</p> <p>Competent Competitor, concentrating on ODM for a list of carefully selected customers, including Clarion.</p>
<p>Founded by two brothers in early 70s as a petty workshop, i.e. the market domain.</p>	<p>A Strong Selling claim, highlighting the capability to respond to the customers' changing preference by regularly updating, improving and developing existing product lines to provide additional features in order to maintain market share and extent product</p> <p>Sales-oriented strategies dominate, relying on product shift and product differentiation to tap into growth opportunities in mature product lines. Followed by business diversification through business relationship (e.g., pager market in China).</p> <p>Top management is still dominated by the two founders, but the combination of the executive directors shows no clear inclination towards the three functions.</p>	<p>1973 1993</p> <p>China market</p> <p>Although its early penetration into the China pager market won its early success, it remains largely a Rear Follower, concentrating on ODM/OEM of consumer electronics like calculators, pagers, and databanks.</p>

<p>RJP</p> <p>Founded by two brothers in early 70s as a petty workshop to serve the subcontracting network -- the Market domain.</p> <p>Selling claim, highlighting the effort in designing and developing novel products for changing customer's taste.</p> <p>Sales-oriented strategies dominate, relying on product shift and differentiation to tape into growth opportunities in mature product lines.</p> <p>The two founders still dominate the management, and the combination of executive directors show an inclination towards the sales and marketing function.</p> <p>Rear Follower, concentrating on ODM/OEM of consumer electronics like databank, electronic games and electronic keyboards for overseas buyers like JC Penny, Radio Shack, etc. Taken over by Applied International in late 1995.</p>	<p>Sold to overseas importers</p>	<p>1971 1988</p>
<p>Recor</p> <p>Founded as a petty workshop, the group was chaired by a graduate from a technical college -- Production domain.</p> <p>Selling Claim, highlighting its in-depth knowledge on the market and its ability to offer customers with quality products at competitive prices.</p> <p>Sales-oriented strategies take charge, with product shift/product differentiation into other mature products topping the list. Research-driven strategies towards any of the three functions. development of new product.</p> <p>Dominated by the family, the combination of the executive directors shows no inclination towards any of the three functions.</p> <p>Rear follower, concentrating on ODM of mature A/V products, with a remarkable feature that a significant portion of its products is sold under the "Recor" brand.</p>	<p>sales to overseas importers and trading agents</p>	<p>1984 1993</p>

<p>Same Time</p> <p>Founded by a couple as a petty workshop. The chairman (the husband) is trained as an engineer – technology domain -- and his wife) is responsible for administration</p>	<p>Selling claim, highlighting its ability to rapidly shift production from one type of electronic product to another to respond quickly to customers' demands and changing market conditions.</p>	<p>Sales-oriented strategies dominate, with product shift/product differentiation into other mature products topping the list. Research-driven strategies follow, stressing in-house design of novel products for the premium markets.</p>	<p>The family dominates the top management, with no clear inclination towards any of the three functions.</p>	<p>Rear Follower, OEM/ODM of low-end consumer products (timepieces, telephones, calculators, databanks and hand-held games) for overseas buyers, with "premium" items accounting for a significant portion of the total sales.</p>	<p>1982 1992</p>
<p>Sharp Brave</p> <p>Founded in mid-80s by a group of four that were engaged in the electronics industry from a diverse background.</p>	<p>Selling Claim, highlighting the continual diversification of product lines to tape into growth opportunities worldwide.</p>	<p>Sales-oriented strategies dominate, relying on the product shift/diversification into new products to cater for changing preferences and needs of its customers; research-driven strategies follow, stressing in-house R&D on new product development.</p>	<p>The four founders dominate executive directors, with the commination showing no clear inclination towards any of the three functions.</p>	<p>Rear Follower, concentrating on ODM of personal electronics to overseas buyers to be sold under private labels; products include calculators, handheld games, translators, etc.</p>	<p>1985 1992</p>
<p>Starlight</p> <p>Founded in 1969 as a petty workshop to assemble transistor radios – Market Domain,.</p>	<p>Selling Claim, N/A</p>	<p>Sales-oriented strategies take the lead, with bushiness diversification in response to market demand topping the list.</p>	<p>The top management is dominated by the family, with the combination of the executive directors showing an inclination towards the production function.</p>	<p>Competent Competitor, concentrating on the OEM/ODM of consumer electronics, with customers including Sony, Sharp, etc.</p>	<p>1969 1988</p>

Tomei	Trained in electronic engineering, the chairman but started the group in mid-70s as a trading firm -- Market Domain.	Selling claim, highlighting the business relationship and broad customer base.	Sales-oriented strategies dominate -- product diversification. After listed in 1988, it further expanded by capital venturing into other electronics firms (it helped 12 firms go public). Production-centered strategies follow (vertical integration).	The founder dominates the top management, with the combination of the executive directors showing no clear inclination towards any of the three functions.	Competent Competitor, concentrating on ODM/OEM of A/V and other consumer products for a list of world's leader including Sony, AIWA, JVC, Sharp, Toshiba, Panasonic, etc. As a trading house, local manufacturers are major customers. Later, the firm step into contract manufacturing for importers in US and Europe.	1974 1988
Tomorrow	Before starting the firm in early 80s, the chairman was trained in mechanical engineering and worked as a design engineer for three years -- technology domain.	Selling claim, highlighting the group's capability to secure stable orders.	Sales-oriented strategies dominate, the early phase marked by product shift and product diversification. Later, the firm stepped into the distribution of parts and components for Seiko-Epson.	Top management is led by the founder, with the combination of the executive directors showing a clear inclination towards sales and marketing function.	Rear Follower, concentrating on ODM/ODM of mature LCD-related products (timers, thermometers, clock, etc), as well as distribution of Seiko-Epson components and parts in Hong Kong.	1983 1995

<p>Truly</p> <p>The founder was in the sales and marketing function before forming the group -- market domain.</p>	<p>Efficiency Claim, highlighting its vertical integrated manufacturing capability and production efficiency to turn out quality products.</p>	<p>Sales-oriented strategies take the lead, including business diversification, and distribution network building. Followed by production-centered strategies, mainly vertical integration.</p>	<p>The founder still leads the top management, with the combination of the executive directors showing no clear inclination towards any of the three functions.</p>	<p>Niche Player, concentrating on the design, manufacture and distribution of calculators, mainly under private labels and its house brand.</p> <p>sales to the US through its own marketing office in LA.</p> <p>1978 1991</p>
<p>Wanon</p> <p>Founded in late 80s by a group of four from a diverse background.</p>	<p>Selling claim, highlighting the corporate capability to respond quickly to changing market demand.</p>	<p>Sales-oriented strategies take the lead, couple with research-driven strategies to design products with proven market demand.</p>	<p>Dominated by the founders, who come from a rather diverse background. Thus the combination of executive directors show no clear inclination towards any of the three functions.</p>	<p>Niche Player, sales to overseas Importers and also through local export houses.</p> <p>private labels and its house brand.</p> <p>1983 1993</p>
<p>Welback</p> <p>Founder by two partners in late 70s as a petty workshop to produce LCD watches for the subcontracting network -- Market Domain</p>	<p>Selling claim, highlighting its capability to cater for different customer preferences and demand.</p>	<p>Sales-oriented strategies take the lead, with product differentiation and business diversification topping the list. Followed by research-driven strategies, mainly product design.</p>	<p>While the two founders still dominate the management, the majority of the executive directors are from the sales and marketing function.</p>	<p>Niche Player, concentrating on the design and manufacture of hand-held games under private labels.</p> <p>Sales to overseas importer.</p> <p>1979 1992</p>

<p>Wing Lee Founded in early 70s as a petty workshop producing plastic moulds, the founder is from the production domain (himself responsible for the production of the group).</p>	<p>Efficiency claim, highlighting its commitment to invest in production facilities, improving its operation efficiency and maintaining the consistency in product quality.</p>	<p>Sales-oriented strategies take the lead, focusing on business diversification into the manufacture of mature components. Production-centered strategies follow, including vertical integration, investment in production facilities, etc.</p>	<p>The top management is dominated by the founder and his sister (family), but showing no clear inclination towards any of the three functions.</p>	<p>Niche Player, concentrating on the large-volume manufacture of switches and connecting components.</p>	<p>Manufacturers in Hong Kong</p>	<p>1971 1997</p>
<p>Wong's Internati onal Founded in early 1960s as a petty workshop producing PCB for the subcontracting network – Market Domain,</p>	<p>Efficiency claim, highlighting the corporate control of the production process to enhance its cost efficiency, and claiming itself a dependable and high quality manufacturer..</p>	<p>Sales-oriented strategies take the lead, business diversification and market expansion topping the list. Followed by Production-centered strategies including vertical integration and advancement in production facilities.</p>	<p>The top management is dominated by the family, with no clear inclination towards any of the three functions.</p>	<p>Competent competitor, fabricating of PCB, OEM manufacturing for world's leader and trading of associated products, equipment and materials.</p>	<p>manufacturers in Hong Kong</p>	<p>1962 1983</p>

C. The Alternative Model

Company	Founder Background	Business Claim	Business Orientation	Top Management Formation	Competitive Performance	Major Source of Order during Form-ation Years	Year of Start-up	Year of IPO
Champion	Technology domain, the founder was a trained as a software engineer.	Research claim, as the group highlights its unique competitive status due to its proprietary paging system and pagers.	Research-driven strategies take the lead, e.g. the invention of the first multi-lingual radio paging system and pager being the keystone of the company's success. Sales oriented strategies follow, including business and market diversification.	The majority of the executive directors are recruited from the R&D function.	Niche Player, concentrating on the design, manufacture and distribution in the wireless communication industry. Not a typical electronics firm in Hong Kong due to its operation of pager and cellular networks in China.	PTT of China	1987	1992
Chen Hsong Holdings Limited	Production Domain, a technical worker in mechanics	A very strong Efficiency Claim, as the Chairman often advocates "Japanese Quality at PRC Costs"	Production-centered Strategies dominate, as illustrated by the early introduction of process upgrade like automation, CIM and FMS, among others, together with expansion mainly through vertical integration.	Directors are mainly recruiting from the engineering discipline	Niche Player, concentrating on plastic injection molding machinery and related businesses	Manufacturers in Hong Kong	1958	1991

<p>Group Sense</p> <p>Founded by two brothers, both trained as electronic engineers -- the technology domain</p>	<p>Research claim, the group attributes its success on a stress on R&D</p> <p>Research-driven strategies take the lead, as shown by early establishment of strong R&D teams in Hong Kong and China; followed by sales-oriented strategies, as shown by vast effort in brand development and distribution network building.</p>	<p>The majority of the executive directors are recruited from the family</p> <p>Niche Player, concentrating on electronic dictionary, a product which the company is one of the pioneer on the market.</p>	<p>Brand marketing in Hong Kong</p> <p>1989 1993</p>
<p>Johnson Electric</p> <p>The founder worked as a salesman (market domain) and started the group from scratch in late 1950s. The Chairman, the son of the founder, was trained in mechanical engineering, from the technology domain.</p>	<p>Production-centered strategies take the lead, as illustrated by the effort in automation, vertical integration and quality assurance. Research-driven strategies follow, as shown by the stress in product development and the establishment of research center</p>	<p>Executive directors are recruited mainly from the family, but the composition still shows an inclination towards engineering personnel.</p> <p>Niche leader, specializing in the design and manufacture of micromotors.</p>	<p>Manufacturers in Hong Kong</p> <p>1959 1984</p>
<p>QPL</p> <p>Founder in early 80s, the chairman is trained in chemical engineering, i.e., from the technology domain.</p>	<p>Production claim, stressing the "one stop globalized manufacturing solution" by vertically integrating into semiconductor-related manufacturing sector.</p> <p>Production-centered strategies take the lead, highlighting vertical integration. Followed by research-driven strategies to chasing the technology race in the semiconductor industry.</p>	<p>The combination of executive directors shows no clear inclination towards the three functions.</p> <p>Niche leader, competing on the world's leadframe and manufacturing and IC assembly market.</p>	<p>sold to IC computer manufacturers and sub-assembly houses in US, and SE Asia.</p> <p>1981 1989</p>

<p>S.Megga The founder-co-chairman was trained as an engineer -- technology domain.</p>	<p>Research claim, highlighting its commitment to product development by in-house R&D team.</p>	<p>Research-driven strategies dominate, being the first HK manufacturer to launch cordless phones in the US and also DECT set in Europe.</p>	<p>Two of the three executive directors are from the engineering function.</p>	<p>Competent Competitor, concentrating on ODM of cordless telephones for AT&T.</p>	<p>AT&T of the US</p>	<p>1981 1991</p>
<p>Varitronix Started in late 70s, the two founders are Ph..D. in Physics before entering into the manufacturing business, i.e. from the technology domain.</p>	<p>Research claim, portraying itself as "research-driven," highlighting its strong design, research and development capability to compete in the niche market.</p>	<p>Research-driven strategies dominate, as shown by the huge investment in R&D for LCD technology and related products.</p>	<p>Led by the two founders, the board of executive directors shows an inclination towards the engineering function (most from the technology domain).</p>	<p>Niche Player, targeting well-defined niche in the area of LCD engineering and total solution provision.</p>	<p>Manufac-turers in Hong Kong</p>	<p>1978 1991</p>
<p>Vtech Started in the late 70s, before that the founder worked three years as an engineering -- from the technology domain.</p>	<p>A strong Research claim, as the chairman always highlights ceaseless R&D as the keystone of the company's success.</p>	<p>Research-driven strategies dominate, as shown by the huge investment in R&D for new products and technology. Sales-oriented strategies follow, as shown by the effort in brand development and distribution network building.</p>	<p>Led by the founders, the board of executive directors is dominated by those with engineering background</p>	<p>Niche Leader, a market leader in cordless phones and educational toys distributed under its own brands in Europe and the US.</p>	<p>sales to the US through its own marketing office.</p>	<p>1976 1992</p>

D. The Mixed Model

Company	Founder Background	Business Claim	Business Orientation	Top Management Formation	Competitive Performance	Major Source of Order Information Years	Year of Start-up	Year of IPO
Benelux	N/A	A strong Efficiency Claim , as the Group highlights its manufacturing expertise.	Production-centered strategies take the lead, e.g. automation program, custom-design machinery and quality assurance, but later shift to sales-oriented ones by lateral diversification into other data storage products.	Directors are recruited mainly from the family , with an inclination towards the sales and marketing function	Rear Follower , concentrating on the molding of data storage products for world's leaders, with subsequent product upgrade confirming to the "follower in the rear" pattern.	N/A	1977	1991
Chun Tai	Working as a production engineer before founding the firm, the chairman is vertically-integrated from the Production domain	A strong Efficiency claim , as the Chairman highlights its vertically-integrated manufacturing capability.	Production-centered strategies take the lead, with production facilities expansion and vertical integration topping the list. Sales-oriented strategies follow, with business diversification the prominent.	The board of executive directors is dominated by those from the production-related experiences.	Competent Competitor , ODM and OEM of consumer electronic for world's leaders like Casio, Panasonic, JVC and Mattel.	OEM for Japan	1987	1997

<p>Elec & Eltek</p>	<p>Co-founded by three pioneers of the HK electronics, two from the production domain (including the Chairman) and the other from the technology domain</p> <p>A fairly strong Efficiency claim, as the group emphasizes its quality assurance and streamlining and improving its production process.</p> <p>Production-centered strategies like vertical integration, quality control and machinery installation take the lead, followed by sales-oriented ones, e.g. diversification into other electronic components and real estate.</p>	<p>The group has the majority of its executive directors from those with experience in production.</p>	<p>Manufacturers in Hong Kong accumulated over 25 years of experience in PCB fabrication and now ranks among world's leading suppliers.</p>	<p>1972 1984</p>
<p>Firstone</p>	<p>Co-founded by a couple, one from market domain (the chairman was a trader of electronic components) and the other from the technology domain (trained in chemical engineering).</p> <p>Efficiency claim, as the directors highlight "reliable quality" as the competitive edge of the group in the industry.</p> <p>Production-centered strategies dominate, as shown by the emphasis on vertical integration and equipment advancement. Sales-oriented strategies closely followed, as shown by its diversification into un-related business (food and beverage).</p>	<p>The top management is dominated by the family, showing no clear inclination towards any of the three functions.</p>	<p>Rear Follower, the group is mainly engaged in the manufacture of capacitor, itself a component of the lower spectrum on the market.</p>	<p>1977 1992</p>
<p>Gold Peak</p>	<p>Started as a petty workshop to serve the subcontracting network. But the present chairman, a son of the founder, was trained as an engineer, i.e. from the technology domain</p> <p>Selling Claim, as stressing expansion in market share and brand development. Followed by research claim -- R&D in new product and technology.</p> <p>Sales-oriented strategies top the list, with brand development, business diversification and distribution network ranked high. But research-driven and production-centered strategies are never neglected.</p>	<p>The top management as a whole is recruited mainly from those with engineering background.</p>	<p>Established for over 30 years, the group has developed into a MNC and a Niche Leader in battery</p>	<p>1964 1984</p>

<p>HB Inter-national</p>	<p>N/A</p> <p>Selling claim, as the group highlights its "one-stop shop" capability to maintain its long established relationship with its customers.</p> <p>Research-driven strategies with sales-oriented strategies, as the company puts the primary emphasis on ceaseless new product development by its 200-strong R&D team for established customers.</p>	<p>The executive directors are consisted of a rather balanced background.</p> <p>Competitor, OEM and ODM of approved telecom products (mainly cordless phones and answering devices), customers including BT, Bell South, Alcatel, NEC, and Telecom New Zealand.</p>	<p>To US through trader in Hong Kong</p>	<p>1982 1994</p>
<p>IDT Inter-national</p> <p>The founder was trained as an engineer – technology domain, and worked as an engineer in an MNC for years before shifted to sales & marketing.</p>	<p>A fairly strong research claim, as the group highlights the application of state-of-the-art LCD technology to its products as a key factor to success.</p> <p>Research-driven strategies (its stress on product development) coupled with sales-oriented strategies (business diversification, market diversification, etc.).</p>	<p>Executive directors are mainly recruited from the sale and marketing function.</p> <p>Niche Player, concentrating on the design and manufacture of LCD-related products.</p>	<p>N/A</p>	<p>1977 N/A</p>
<p>Innovative</p> <p>An engineer before starting the firm, the chairman is from the technology domain</p>	<p>Research claim, the chairman highlights its use of technical know-how to make the group a leader in cars accessories</p> <p>Research-driven strategies coupled with production centered strategies constituted the group's success. But business diversification later takes charge, indicating a shift towards sales-oriented strategies.</p>	<p>By the time it went public, the top management shows no inclination towards any of the three functions. But sales and marketing function later takes charge.</p> <p>Niche Player, make use of its technical know-how to concentrate on the design and manufacture of car antennas and accessories.</p>	<p>Buyers in Europe, sold under private labels</p>	<p>1977 1991</p>

<p>Jackin</p> <p>A financial analyst before starting this firm, the founder is engaged mainly in marketing function for the group.</p>	<p>Selling claim, stressing the importance of spotting the market demand.</p> <p>Sales-oriented strategies take the lead, with diversification into products with proven market demand being predominant. Followed by production-centered strategies like investment in advanced equipment and vertical integration.</p>	<p>Executive directors are mainly recruited from the family, with a rather clear inclination towards sale and marketing function.</p>	<p>Competent Competitor, concentrating on the manufacture of information storage media products for world's leader, including Sony, TDK, Microsoft, IBM, etc.</p>	<p>OEM customers and duplicators</p> <p>1983 1996</p>
<p>Karry</p> <p>The chairman was a factory manager before founding the group, i.e., from the production domain.</p>	<p>A Strong Efficiency Claim, as the group highlights manufacturing capability and quality assurance as key factors to success.</p> <p>Production-centered strategies take charge, as shown by a stress in vertical integration and quality control. Followed by sales-oriented strategies, with product diversification topping on the list.</p>	<p>The management is recruited mainly from the family, with those from production function forming the majority.</p>	<p>Competent Competitor, concentrating on the tooling and molding business for world's leaders like IBM, Simens, Digital Equipment, Mita, etc.</p>	<p>a video cassette distributor in Germany</p> <p>1980 1996</p>
<p>Ocean Information</p> <p>The group was started by the Chairman as a computer retail store, i.e. the market domain.</p>	<p>Research claim, stressing the R&D capability to turn out innovative products on proven technologies.</p> <p>Research-driven strategies take the lead, R&D team even being set up before acquiring its own production facilities.</p> <p>Sales-oriented strategies follow, including market diversification and product differentiation.</p>	<p>The combination of executive directors shows no clear inclination towards the three functions.</p>	<p>Competent Competitor, concentrating on the design and manufacture of computer motherboards, add-on cards and peripherals.</p>	<p>N/A</p> <p>1985 1992</p>

<p>Team Concept</p>	<p>Founded by three partners in late 70s as a design-based company; spinned off from a local electronics firm in which the founders held management position – Market Domain.</p>	<p>Research claim, highlighting its commitment to product development by in-house R&D team.</p>	<p>Research-driven strategies take the lead, starting in the late 70s as a design-based company of telecom products. Sales-oriented strategies follow, with product differentiation and diversification topping the list.</p>	<p>Led by the founders, and the combination of the executive directors shows no clear inclination towards any of the three functions.</p>	<p>Niche Player, concentrating on ODM of approved telecom products and educational toys.</p>	<p>Sales to importers in the US</p>	<p>1978 1991</p>
<p>Termbray</p>	<p>Started as a one-man petty workshop in late 60s to serve the subcontracting network – market domain.</p>	<p>Efficiency claim, stressing its sophisticated machinery and vertical integrated capability to respond efficiently and swiftly to customer's changing needs.</p>	<p>Production-centered strategies take the lead, stressing on investment in production machinery. Sales-oriented strategies follow, product shift and product differentiation topping the list.</p>	<p>Led by the family the combination of the executive directors shows no clear inclination towards any of the three functions.</p>	<p>Competent Competitor, concentrating on the fabrication of PCB (multilayer) on the one hand, and OEM for world's leader, eg. AT&T, Atari, Commodore, on the other.</p>	<p>Manufacturers in Hong Kong</p>	<p>1968 1991</p>
<p>Yanion</p>	<p>Production Domain, the founder was a technical worker before establishing the firm in 1966.</p>	<p>Efficiency Claim, highlighting its vertical integrated manufacturing capability and production efficiency to turn out high-precision, high-quality parts.</p>	<p>Production-centered strategies take the lead -- vertical integration and continuous improvement in efficiency and quality of its product by advancement in production facilities. Followed by sales-oriented strategies like business diversification.</p>	<p>Led by the founder's family, showing no clear inclination towards any of the three functions.</p>	<p>Niche Player, concentrating on the manufacture of precision metal parts for used in the electronics industry, principally cassette mechanical drives.</p>	<p>Manufacturers in Hong Kong</p>	<p>1966 1991</p>

<p>Yeebo</p>	<p>Before founding the firm in 1988, the three founders were experienced in the field, but from a rather diverse background in terms of training and functional adherence.</p>	<p>Efficiency Claim, stressing its engineering capability to develop processes, machinery and equipment for manufacturing LCD, and hence ensuring low cost and high efficiency.</p> <p>Production-centered strategies dominate, highlighting vertical integration, efficiency improvement and cost reduction by developing process, machinery and equipment for manufacturing LCD.</p>	<p>Executive directors mainly include the three founders, showing no clear inclination towards any of the three functions.</p>	<p>Niche Player, concentrating on the manufacture of low-cost, high-volume LCD, a widely-used electronic component.</p>	<p>Manufacturers in Hong Kong and Southeast Asia</p> <p>1988 1993</p>
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Appendix 2: In-depth Interviews with Hong Kong Electronics Firms

This paper is set to uncover organizational dynamics, and so I conduct in-depth interviews with key executives of six electronics firms selected on a theory-driven basis. All Interviews are tape recorded, and then transcribed for further analysis.

The Interviewees

Company	Post Held by the Interviewee	Why This Company
Fook Lung*	Founder and Owner	This firm is a typical small firm that has been a subcontractor throughout its development, never showing a move to get ride of the subcontracting network.
True Light*	Founder and Chairman	This firm, one of the leading OEM in Hong Kong, shows how far the subcontractor model can go. Also it will shows what makes one OEM perform better than the others.
Innotech*	Founder	This small firm showed a radical shift in business in recent years. A look into in it will show what makes a shift away from the subcontractor role possible.
Faith*	Executive Director	This firm made an ambitious attempt to go up-market after its success in low-margin, large-volume manufacturing. A look into it will show what it takes to succeed in such an upgrade move.
Varitronix	Chairman	Provided exceptions prove the rule, a look into this atypical firm helps clarify what hinders the spreading of research-driven firms. Besides, it certainly helps account for what makes a research-driven firm different from the dominant model.
Chen Hsong	Section Manager	Another atypical firm in Hong Kong. It is chosen due to the same reasoning as in the case of Varitronix.

Note: 1) Companies are arranged in order of appearance in the thesis.

2) Those company names with an * are faked to assure our interviewees of anonymity.

Some General Rules for Interview

1. To gather data relevant to theory, the questionnaire is so designed that open-ended questions dominate to facilitate follow-up ones. Though the interview may not follow a clear procedure, questions are categorized to ensure standardized coverage for each interview.
2. With basic information on the interviewee before each interview, I seek to put emphasis on target categories according to the company particular. For example, if the company has a dominant buyer, the interview would probably be structured to explore their relationship. Likewise, interview with a company showing a tendency to vertically integrate will be evolved around this strategic choice. Therefore, various categories may contain overlapping questions.
3. Generally speaking, historical approach would be preferred in each interview because more information about organizational evolution is obtained.

The Questionnaire for a semi-structured interview

Start-up mode

Why you start up the company? What did you do before? What is the first product line you engaged? Why did you choose that? From whom your first order came? How did you get the paid-up capital? How long did your company begin to profit?

What is the most important or successful step/decision you ever made that establish the success of the company? How is that made? Under what circumstances?

What is the usual way of getting order now? How importance is the source?

Evaluate the importance of OEM orders for your company, in terms of value and number of models.

Product Design and Development

What is the most successful products ever made by your company? Please detail how it is developed under what circumstances? How successful it was? What was its effect on the company growth?

How often do you launch an in-house-designed product now? What is the procedure of the introduction of a new product? What is the most frequent change in a new product (cosmetic, features, etc.)?

Who or which department would be the most frequent initiator of a new project?
Do you have a software design dept.?

Brand Development

When did you develop your own brand? How?
What is the ratio of house brand and private label/OEM?

Production and Process Upgrading

Do you use CAD/CAM; CIM; or SMT, etc.? Why and when? Comment its effect on your competitiveness.

What is your QC/QA system? Comment its effect on your competitiveness.

Do you have ISO 9000 certificate? Why and when? Comment its effect on your competitiveness.

Relocation

What made you relocate? Did you consider any choices other than relocation?
What is the benefit and loss of relocation? Any labour resistance during relocation?
How is that resolved?

What is the division of labour between Hong Kong and China?

What was the effect of relocation on your business development? Any advantages or disadvantages?

Product line shift and diversification

Is the current predominant product line the one five years ago or when start up?
Why such a shift? Usually how often you shift the product line?
How many product lines are you engaging? Why entering those line?
Why did you enter unrelated product lines?

Competitiveness

On where does your competitive edge lies -- cost, market intelligence, flexibility etc.?
Which element you consider the most important? Please detail why that is so.
How would you comment on your relative competitiveness -- e.g. on the rise over the past few years or vice versa? Why?
What is your business plan in the near future? Who contributed to this strategic choice?

Relative importance of functional departments

Which functional department was first established in your companies – sales, marketing, production, QC, engineering, R&D? Please specify the current size of each dept.

What is your own background and career path?

Who is in-charge in the administration of the company now? What is his/her background?

Discuss the present organizational structure -- centralized control with functional departments vs. decentralized control with multi divisions? Who is in charge in the overall hierarchy?

Interaction in organization

Was there any crisis in your company during the years? What is the nature of the crisis -- production delay, capital shortage, market saturated, etc. How was that resolved?

Discuss the decision-making process concerning the launch of a new product. How do you decide a new product to be launched?

Concerning the major strategic choice, how is it usually reached? Who and which department would be the most probable contributor?

Interactions with market, buyers and suppliers

How do you get orders? How do you sell your goods -- through own distribution channel, distributors/buyers, traders, etc.?

Do you have a consistent dominant buyer? Over the years do you change your buyers? How would you describe your relationship with your buyers? Any technology or information gained from them?

When you upgrade your products, do you need to find some new buyers/sales channels?

How do you approach your market? How do you get market information to decide what product to launch next?

How would you describe your relationship with your suppliers? Did you change

your suppliers after relocation?

On organizational field

How do you think your competitors come from? What is your competitive edge over them; do your strategies differ from them?

Which electronics manufacturer or manufacturer in general you consider the most successful in Hong Kong? Why?

Does interaction among Hong Kong manufacturers intense? Do you think you have a different strategy from them?

How would you describe your relationship with other industrialists in H.K.? How would you describe the mainstream of Hong Kong electronics industry? Do you think you are different?

What is your opinion about HKFI, HKEA, etc.

Organization-institution interaction

Did you get any contact with governmental or semi-public bodies? Industry Dept., HKPC, TDC, HKITC, etc.? Which one you think is the most relevant to you? Please detail the project you participated or in what aspect these institutions help you?

What is your opinion about the universities and VTC; do they supply the people you need, if not, how do you train your own staff?

What are the difficulties to do business in Hong Kong? Did the nature of these difficulties change over the years? What is the major source of your production technology? What is the major source of capital?

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