Flexibility and Adjustment: The Hong Kong Watch Industry and Global Change

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ABSTRACT A case study of the Hong Kong watch industry demonstrates the adaptive flexibility of labor-intensive industrial clusters. The study describes the evolution of industry in Hong Kong, and highlights the unique attributes of the country's economic history which have influenced the structure of production systems in the country. Focusing on the role of global competition, the case study identifies the constraints posed by a labor-intensive flexible production system in the face of continuous technological change in the industry.

Introduction

In the evolving literature about industrial flexibility, there remains considerable debate about what constitutes "flexibility" and the attendant social and institutional relationships that accompany such systems of production. The seminal work by Piore and Sabel (1984) identified a movement toward flexible production and production organization as a response to saturated mass consumption markets, crises in Fordism, and the emergence of alternative forms of manufacturing based around general purpose production technology used to produce highly specialized goods.

The model of flexibility sketched in the early 1980s was validated in case studies of a number of prominent regions around the world. Geographic complexes of industry in such realms as Emilia Romagna in Central Italy, Baden Württemberg in Germany, and Sakaki in Japan evolved as systems of production based upon high levels of specialization among firms. Knitting the complexes together was a system of competition and cooperation among firms that, when

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aggregated, comprised regional systems of production and innovation with the capability of manufacturing products for global markets (see Becattini 1987 on Italy; Sabel 1988 on Germany; and Friedmann 1989 and Florida and Kenney 1994 on Japan). This optimistic view of flexible specialization was criticized by some as representing little more than examples of seamier forms of development: sweatshops, the putting-out system, and extensive levels of subcontracting by large firms (Lazerson 1989). Other authors criticized the romantic conception of flexibility by suggesting that these clusters were plagued by intense cost-based competition, and were subject to destructive struggles over market share (Amin and Robbins 1990; Blim 1990).

The debate was further strained by a persistent inability to define "flexibility." Were firms really producing different types of products or were they just creating variations on the same theme? (Gertler 1988). The discussion of flexibility became mired in a more political and contentious debate about the role of small firms in advanced industrial economies. Several authors countered this view, noting the role of large firms in these districts (Storper and Harrison 1991). Some authors further suggested that large firms were in fact the drivers of these flexible production systems. In other words, large firms were simply externalizing component production that was aggregated into final products (Harrison 1994).

Today, the debate stands at a crossroads. Several of the classic centers of production have faltered or have been transformed through international competition. Even in the most widely cited settings, districts of flexible firms face problems of internal regulation in the face of growing international competition and global change. Silicon Valley, heralded as a region capable of significant adjustment in the face of considerable instability, even finds itself without the needed regulatory institutions to ensure longevity (Saxenian 1994).

Most discussions of flexibility and flexible districts have emphasized geographic clusters in the developed world (see Knudsen et al. 1994; MacPherson 1994; Rutherford 1994; Florida and Kenney 1994 in this issue; notable exceptions include Storper 1987 on Brazil; Villas 1991 and Choo 1994 on Korea; Barff and Donaghu 1991 on Taiwan). Few studies have examined flexible districts in developing countries in the context of a global industry that is highly competitive and ever changing. Fewer still have examined the question of the adaptability of labor-based flexible clusters threatened by globalization. The intent of the following case study is to fill this gap.

The case study of the Hong Kong watch industry raises a number of important issues regarding the adaptability of an extensive production cluster in the context of substantial global change. Answers are sought to the following questions: How well do complexes of flexible firms manage change? To what extent is adaptation a function of skill, product, market, firm strategy, and access
to inputs? What role do core technologies play in the adaptability of firm clusters? In other words, what characteristics help explain the adaptability of firm clusters to alterations in markets, competitors, and products?

In this paper, the Hong Kong watchmaking industry and its ability to adapt in an era of global change are examined. By evaluating empirical data and anecdotal evidence gathered in Hong Kong and from academic literature and industry sources, I expand upon issues thought to be crucial to regional adaptation. Moving from a history and discussion of the current position of Hong Kong in the international watch industry, a series of questions are answered about the evolution of the watch industry and the role of public and private institutions in facilitating change. The paper begins with a brief history of the island country post-1949. The structure of the manufacturing industry is then examined in light of the particular historical development experience of the entrepôt economy. A detailed description of the watch industry is then presented and the industry is situated in the global system of watch manufacturing. The paper concludes with an assessment of the ability of Hong Kong’s watch industry to adapt in the face of continuous economic change.

**History of Hong Kong**

Prior to 1949, Hong Kong’s economy centered on its role as an entrepôt, particularly serving as a trade outpost for China and other Far East nations (Henderson 1989; Hsia and Chau 1969; Riedel 1974; Youngson 1982). The island’s regional prominence derived from its monopolistic position as gateway to the West.

However, starting in the 1950s, Hong Kong’s economy has evolved from trade dependence to export-based manufacturing. This transformation was triggered by three major events. In 1949, the Chinese Communist Revolution drastically curtailed the consumer markets of Hong Kong’s largest trading partner. During the Korean War in 1950, a United Nations-initiated trade embargo against all Chinese goods further diminished Hong Kong’s markets. An influx of immigrants fleeing China’s political upheavals resulted in severe unemployment and a harsh economic environment.

An estimated 1.285 million refugees entered Hong Kong between 1945 and 1949, effectively doubling the country’s pre-war population. Hong Kong was ill-equipped to deal with this development; with its traditional livelihood (trade) eliminated, it was confronted with unprecedented economic problems. As unemployment skyrocketed, the island had little choice but to pursue an export-led development strategy.
The City State of Hong Kong

Hong Kong is a small, densely populated city state; most of its population is perched around the rim of Hong Kong Harbor. The country has no effective trade barriers and was in many ways poised for success in exports. Hong Kong’s economy is considered to be among the most open of any industrializing nation today. Its many years as a trade entrepôt resulted in the formation of a high-quality and sophisticated maritime infrastructure, strong commercial ties to external markets, and enormous trading experience.

Massive in-migration from China in the early 1950s added considerably to the country’s intellectual and entrepreneurial labor pool and capital base. Hundreds of thousands of Chinese with high levels of skill and large sums of cash sought asylum in Hong Kong. But even before this, since 1945 (when the Communists first gained power) the Chinese who had anticipated greater political turmoil had been sheltering personal assets in Hong Kong banks.

Many in-migrants to Hong Kong were merchants and members of the Shanghai intelligentsia (Wong 1988). They had both the personal resources and the know-how to start businesses in Hong Kong. These immigrants differed qualitatively from the traditional immigrant flows from other developing countries, which consisted largely of peasants leaving rural agriculture for jobs in cities. Thus, Hong Kong received both the more skilled and entrepreneurial members of Chinese society and a vast number of people who arrived destitute and in search of any type of work. The country’s human capital base was substantially strengthened and its labor force was greatly expanded.

But Chinese immigrants brought more than just skills and capital to Hong Kong. The political turmoil and personal uncertainty of the Chinese Revolution created a great sense of anxiety among mainland Chinese seeking asylum on the island. Given the lack of a state-supported social safety net, hard work and a willingness to endure extraordinarily long hours for little compensation became the only viable means of survival. Hong Kong’s industry is characterized by a productive labor force willing to work for low wages.

The island’s lack of natural resources and land has made it highly dependent upon trade for both material goods and basic food stuffs. Proximity to China has been essential in filling these needs. Hong Kong is almost completely dependent on the mainland for its food and a large portion of its water and power supplies. Since the 1950s the low cost of labor on mainland China has kept Hong Kong consumption goods—particularly foodstuffs—inexpensive. This has allowed manufacturing wages to remain low, and it has also meant that Hong Kong exports could be priced competitively. Thus, even as industry growth rates rose dramatically, wage inflation was suppressed by an artificially low cost of living.

The government’s role was also essential to the early development of Hong Kong’s economy. Minimal tax rates facilitated high rates of business earnings
reinvestment, contributing to rapid capital turnover. Public services were also inexpensive, particularly transportation. The national government subsidized industry through the provision of low-cost housing and other public services. Thus, while free-market adherents regularly reference Hong Kong as the most liberal of newly industrializing economies, in fact non-market intervention government programs have been instrumental in maintaining favorable conditions for industry. Even today transportation, housing, and other forms of infrastructure are heavily subsidized (Schiffer 1991).

But assistance does not extend to regulation of workplace conditions or individual welfare programs. For example, workers are not provided with medical or unemployment insurance. The labor movement is also quite weak. Less than 20 percent of employees are unionized (Levin and Chiu 1992). Given a number of historical circumstances, there is effectively no shop-floor union organization and the union movement is fractured due to differences among political parties. With little government or union-sponsored protection, residents face a cruel reality: they must work or starve.

Structure of Hong Kong Manufacturing

Unlike that represented by the other papers in this issue, Hong Kong’s manufacturing industry consists fundamentally of labor-intensive assembly (Lin, Mok, and Ho 1980; Hong Kong Government Industry Department 1985; Lui and Chiu 1994). If manufacturing is defined as the employment of either chemical or mechanical processes to convert raw resources to consumer and producer goods, few sectors qualify. Despite record output growth rates, capital investment levels in Hong Kong industry are surprisingly low. Manufacturing establishment size has been decreasing over time—signifying the persistence of small production units. A large share of total establishments on the island are sweatshops.

Lack of capital investment in manufacturing stems from a number of interrelated factors. First, in the 1950s labor was relatively abundant compared with either land or capital. Production was organized around the country’s most available resource—its labor force. Second, the economy’s sole dependence on exports made it vulnerable to unexpected declines in markets. To limit risk, manufacturers minimized investments in capital equipment while maintaining the flexibility associated with labor-intensive manufacturing. Third, the largest share of Hong Kong’s manufacturing employment has remained in apparel production, which resists the application of new technology to reduce labor inputs (Lau and Chan 1991). This sectoral structure has served to further expose production employment on the island to intense international competition from other, lower-cost countries (Lui and Chiu 1994).
International trade policy has also influenced the structure of production on the island. For example, the garment industry is regulated through an international quota system. In the case of garments, the Hong Kong government has restricted the amount of production reexported out of Hong Kong from the mainland by means of an origins rule. As Lui and Chiu note, “For those products exported to restrained markets, a special outward processing arrangement is administered by the Hong Kong Government Trade Department to ensure that goods manufactured in Hong Kong but partly processed in China only qualify for Hong Kong origin status if they fully meet Hong Kong’s origin rules” (p. 62; Hong Kong Government Industry Department 1990 and quoted in Lui and Chiu 1994). This has, to some extent, helped preserve the industry on the island.

Many Hong Kong manufacturers are former merchants taking cues not from production processes but from the market. A traditional manufacturer’s priority might be to employ state-of-the-art processes toward a higher quality but standard product. In contrast, merchant manufacturers are perhaps more highly motivated to respond to consumer preferences and get products into customers’ hands, regardless of process. Finally, political uncertainty has contributed to a mentality of “get rich quick”; thus, Hong Kong entrepreneurs have historically had expectations of very fast payback on investment (sometimes in less than three years).

Hong Kong manufacturing persists in a labor-intensive production system for three reasons. First, labor-intensive production is flexible; producers can quickly organize a labor force. Second, an elaborate subcontracting system facilitates the rapid manufacture of a wide variety of products with minimal personal capital investment. The responsibility for capital investment falls on successive levels in the subcontracting hierarchy. This manufacturing arrangement also determines which products can be manufactured profitably. Because each producer attempts to minimize capital investment, the system remains undercapitalized, thus labor-intensive. As Lui and Chiu note: “automation does not necessarily keep production costs down in the short run. In an industry which is dominated by small capitals, alternative strategies are often formulated within a framework of short-term calculation—these small manufacturers have no control over product markets and have to respond to rapid changes in the market” (p. 61; 1994).

Finally, subcontracting helps ensure flexibility because small, dependent firms act as buffers when markets shift unexpectedly. Lack of capital investment ensures that the effects of economic instability are borne almost solely by labor. Although an entrepreneur with a good idea can set up shop quickly and begin production, low barriers to entry in most industries mean that the profitability of even a new product is quickly eroded as others enter the market. When markets sour, producers simply stop manufacturing, often shifting to entirely different industries to take advantage of the next wave of economic opportunity.
This production structure is clearly visible in a 1976 analysis of Hong Kong’s economy in which faculty at the Chinese University of Hong Kong noted that the production function of manufacturing was constant across industries (Lin, Mok, and Ho 1980). The relative proportions of capital and labor were the same. By many accounts this system of “flexibility-within-fluctuation” accurately describes Hong Kong’s industrial base. Markets are ephemeral, and plant closure rates are high. Small firms using general forms of technology and requiring low capital investment are therefore well-suited to the country’s economic situation. These results have been updated by Lui and Chiu at the University of Hong Kong Department of Sociology, with little change seen in the underlying structure and organization of the Hong Kong industry (1994).

What Has Rapid Growth Produced?

Hong Kong’s growth over the last 30 years is by any measure impressive. Transformation during the second half of this century to export-led development is dramatically reflected by the fact that in 1976 almost 45 percent of Hong Kong’s population was engaged in manufacturing. More recent figures indicate that 30 percent of the nation’s workforce is employed in manufacturing (Chowdhury and Islam 1993). Yet by most standards, the country is still underdeveloped. Income distribution is highly uneven, and a large segment of the population exists at or below subsistence levels. Workers toil long hours (usually 10-12 per day; 26-28 days a month), and the working conditions in manufacturing are among the worst in the world (Hsia and Chou 1969; Lin, Mok, and Ho 1980; Riedel 1974).

Workers enjoy little of the fruit of their labor. In the mid-1970s, researchers found that while labor productivity had increased substantially over that of the 1960s, labor’s share of income from manufacturing actually declined. More current figures show little change in the distribution of wealth among Hong Kong’s manufacturing workers (Chowdhury and Islam 1993). While income inequality decreased during periods of rapid growth, coefficients of inequality increased over time. Thus, while Hong Kong’s emergence as a manufacturing center is truly remarkable, it has not been without sacrifice.

Hong Kong’s export-led strategy of economic development has been highly successful. By 1976, exports were 88 percent of Gross Domestic Product (GDP). Today, virtually 95 percent of all goods produced are exported (1994). Although this figure has continued to climb in recent years, and trade provides some assurance of Hong Kong’s continuing survival, the nation’s economic future is not without threats. The nature of manufacturing and Hong Kong’s position in the Far East have led entrepreneurs to formulate a distinctive philosophy. Given potential political instability, quick returns on investment are required. Virtually
no investor is willing to extend himself beyond the immediate period within which the effects of current events can be forecast with reasonable assurance. This has led to an undercapitalized production system managed by entrepreneurs expecting rapid rates of return. Adding to a mentality governed by short-term returns, the island country reverts to Chinese authority in 1997. This alteration in political status has caused many investors to limit their resource commitments to manufacturing.

Finally, in the 1980s, intense competition for physical space resulted in a dramatic rise in land prices and produced a boom in the land market. This led producers to move out of manufacturing and into real estate (Lui and Chiu 1994). The absorption of land put further pressure on the costs of production. Cost pressures were also experienced through the labor market. The success of Hong Kong’s manufacturing sector has resulted in labor shortages and therefore rising labor costs. As a result, manufacturers, particularly in the more labor-intensive industries, face intensified competition from lower-cost countries within the Pacific Rim (Lui and Chiu 1994).

Summary of Hong Kong History

Given its poor resource base and shortages of land and capital, Hong Kong’s comparative advantage has been its abundant labor force. This advantage has been deployed as a highly flexible production system of small manufacturers and elaborate subcontracting arrangements. Hong Kong industry has no capital to redeploy or depreciate, only nimble fingers to instruct. Product cycles (within families of products) can be especially short. No better example of the Hong Kong manufacturing method exists than the watch industry.

History of Watchmaking in Hong Kong

Like other Hong Kong industries, watch- and clockmaking are relatively young. In the early 1950s, the industry began with the production of watch accessories such as cases, bands, and dials. Firms rapidly progressed to assembling mechanical watches (with imported movements from Japan, Switzerland, and other countries) and clocks (manufactured primarily with locally produced movements and parts).

Early in the 1970s, with advances in diode technology, Hong Kong watch assemblers moved into light-emitting digital (LED) display watches. LED watches dominated output for a short time, but declined when liquid crystal display (LCD) watches emerged later in the decade. Until the early 1980s, this newer technology dominated the Hong Kong watch industry.

In the late 1970s, the price commanded by an LCD watch fell drastically from HK$38 to HK$11 (from U.S. $5.00 to $1.50; Hong Kong Government
Industry Department 1985). Initially, lower input costs, fueled by price competition among U.S. semiconductor producers, drove prices down. Prices fell even further, however, as price competition set in among Hong Kong watch assemblers. LCD manufacturing requires simple and inexpensive equipment. Thus, barriers to entry into the market were minimal. Many firms began assembling watches, largely for U.S. semiconductor producers, and as competition heated up, prices fell. Japanese watch production further eroded prices. By 1980, many Hong Kong watchmaking firms were losing money as both competition and the international recession depressed prices and profit levels.

In the early 1980s, the emergence of quartz analog watches breathed new life into the industry. Like other components of watch manufacturing, quartz analog watch production in Hong Kong relied upon foreign parts. Because it also required a higher level of capital investment, Hong Kong's production system took some time to adjust.

But adjust it did. Since the mid-1980s, quartz analog watches have come to dominate the industry, and evidence of their growing importance is striking. In 1980, digital watches accounted for approximately 60 percent of the value of total watch output. Analogs made up only 8 percent, and mechanical watches accounted for the remainder. In 1984, quartz analogs and digitals each made up approximately 43 percent of total output value (Hong Kong Government Industry Department 1985). By 1989, quartz analog watches dominated the market, accounting for 84 percent of total output by value. Digital watches made up only 6.6 percent. Because of its extremely fluid industrial structure, a rapid and complete transformation of the watch industry's product mix was possible (Hong Kong Trade Development Council 1989).

Hong Kong watchmakers have never completely abandoned the mechanical watch. A few firms still assemble mechanical watches from imported movements (Hong Kong Government Industry Department 1985; Hong Kong Trade Development Council 1989). But because of skill and quality requirements, industry output has remained low. Capacity also stems from the complicated nature of mechanical watch assembly, which requires higher levels of scarce capital and floor space.

Mechanical-watch share has been declining since its 1980 high of 27 percent. By 1989, mechanical watches accounted for only 23 percent of total exports. Unlike other industry segments, a larger share of mechanical watches are marketed in third-world countries. The decline in low-value mechanical watches’ share of total output means that at least superficially, the Hong Kong watchmaking industry has kept up with technological trends. However, this misrepresents the relationship between advances in assembled product and those in manufactured inputs. While Hong Kong's industry has been propelled by technological advances in watch-movement manufacturing, Hong Kong watch producers
continue to respond to innovations rather than develop new process technologies and products.

But Hong Kong is an established forerunner in innovation and exportation of watch parts, cases, bands, and accessories. The case and band industry is well developed, and Hong Kong firms export finished products to major watch-producing countries that include Japan, Switzerland, and the U.S. Surprisingly, even upscale companies such as Cartier use Hong Kong watch bands. In 1984 (the latest year for which statistics are available), 484 case-making firms were employing 9,200 workers in Hong Kong.

Ironically, it is within this industry segment that firms have developed some level of technological leadership and unchallenged market acceptance. Hong Kong's world-renowned case and band assembly industry has little competition. A large watchmaking firm interviewed for this study indicated that it uses CAD/CAM (computer-aided design/computer aided manufacturing) for the design and manufacture of cases and bands. This new computer-based technology allows rapid model changes and facilitates the design and manufacture of complex watch cases and bands. Thus, Hong Kong has amassed both know-how and capital and invested them in this market segment (in contrast with other Hong Kong industry in which there is no proprietary knowledge or reputation). Clearly this divergence from traditional Hong Kong manufacturing strategy merits further investigation.

In addition to case and band production, Hong Kong boasts a well-developed accessory industry that caters to watchmakers. While there were less than 20 watch-glass makers in 1984 (the last year for which data were available), numerous dial, electroplating, and button-cell-battery firms exist. Most battery production is fully automated—a rarity in the watch industry complex.

Due to low labor costs, some movement-assembly capacity has evolved in Hong Kong. Unfortunately, information on this development is sketchy. The Swiss Watch Manufacturers Association indicated that one producer has established a quartz-movement assembly facility in Hong Kong. The plant is operating at partial capacity while workers are trained in movement manufacturing. Parts are imported from Switzerland, and Hong Kong workers provide low-wage labor. Although this development seems to suggest that Hong Kong is beginning to sprout the technical roots of a watch industry, the location of movement assembly is simply another facet of Hong Kong's traditional assembly structure. The extent of technology transfer is not clear.

**Organization of the Hong Kong Watch Industry**

The number of watch assemblers has continued to grow in Hong Kong. In 1988, there were approximately 1,386 watchmaking firms registered with the Hong Kong government. From 1983 to 1988, employment increased steadily
from 25,200 to 26,444. But many more new firms were established during the same period. Over 90 percent of firms employ fewer than 50 employees. Labor constitutes approximately 68 percent of operating costs (excluding materials and other business services). But labor accounts for only 8 percent of gross output (compared with input's 84 percent).²

In 1993, there were 1,477 establishments; however, employment declined considerably over the previous five years. The industry declined by almost 10,000 jobs, falling to 17,110 employees (Hong Kong Trade Development Council 1993). Decline in employment was not reflected in share of national exports. While the number of jobs in the industry has declined steadily since the late 1980s, nonetheless, watches still contribute approximately 7 percent of domestic exports, a figure that has not changed since the mid-1980s.

Hong Kong watchmakers produce thousands of watch models each year. A recent promotional document of the Hong Kong Trade Development Council lists hundreds of watch styles (Hong Kong Government Industry Department 1990). Assembling in excess of 300 million units last year, Hong Kong produced more watches than any other nation. Based on value of exports, the country recently surpassed Japan to become the second largest watch producer (behind the Swiss). By 1988, export value of watch production had displaced the toy industry and risen to third place behind the clothing and textile industry and electronics exports.

Recent Industry Trends

Hong Kong industry output has experienced impressive gains since the late 1950s (excluding recessionary years). Since 1980, exports have increased at an annual rate of 15 percent—with recent growth trends topping 20 percent. Post-1989 growth rates are projected to be 25 percent annually. Up until the late 1980s, strong growth trends persuaded watchmakers to maintain production within Hong Kong rather than decentralizing it to mainland China. International trade policy further cemented the assembly of watches on Hong Kong Island. Traditionally, international trade law restricted the name of origin of a watch product to the country of assembly. This helped to maintain watch assembly activities in Hong Kong. In 1991, however, this all changed. Hong Kong unilaterally redefined its trade law to indicate that a watch’s origin would be determined by where the movement came from (Hong Kong Trade Development Council 1993). This allowed Hong Kong watch producers to use the label “made in Japan” or “made in Switzerland” on its watches. Consequently, the re-export trend has only recently been significant (as the absolute level of available labor has significantly declined). Today, only 42 percent of watches exported from
Hong Kong are assembled there. Approximately 23 percent are assembled in China and re-exported from Hong Kong.

Ten years ago, Hong Kong watchmakers operated mostly as OEMs for discount houses and retail outlets. Manufacturers produced models to specification, rarely offering their own ideas. Today, things have changed significantly as many watchmakers move from OEM business toward the development of unique styles.

Hong Kong watchmakers are selling watches for every occasion. Their goal is to convince consumers that a watch is a fashion statement and clothing accessory. This implied level of product variation is Hong Kong’s trademark, and the production system operates within the philosophy. As one manufacturer noted, “The Japanese always talk about automation, but it [automation] also restricts flexibility and creativity that a labor force provides. As watches become more fashion accessories, people will appreciate interesting hand-crafted items” (p. 21; The Federation of Hong Kong Watch Trades and Industries Ltd. 1989).

The Hong Kong industry is highly sensitive to variations in customer preferences across countries. High-end watches sell well in Europe and Japan, while low-priced models dominate the U.S. market. Over the last ten years, the Hong Kong watch and jewelry industries have begun to merge. Moderately priced watches with semi-precious stones and more upscale cases and bands are particularly successful at penetrating the lower end of the U.S. jeweled watch market. They are making significant inroads into the medium- to upper-priced Japanese markets as well. The combination of the two industries allows for extensive variation. But the bottom line is still perceived to be price. As one manufacturer noted, “the benchmark for success or failure in the fickle world of watchmaking does not lie in design. Ultimately buyers make their choice based on price” (p. 41; The Federation of Hong Kong Watch Trades and Industries Ltd. 1989). Such an outlook pervades the Hong Kong industry, where even the highest quality watches are priced far below comparable brands manufactured in other countries.

Hong Kong watch prices (FOB) are extraordinarily low by world standards. The average price of a watch in 1988 U.S. dollars was $3.00. Advertised prices ranged from $4.00-10.00 per watch (with a lead time of between 25 and 60 days). Even jeweled watches cost a fraction of those manufactured in Switzerland. Orders can be as small as 100 watches, and in some cases firms have no minimum lot size.

Hong Kong watches appeal to fickle consumers. No matter how successful a design is initially, few producers think models will be popular for more than one year. As one manufacturer noted after introducing a new style, “it is difficult to tell how long watch designs will last as people treat these things as fashion items.” Another watchmaker noted, “this new model we recently
introduced will probably have a one year life and then we’ll change it to keep up with the market. Whatever the market, Kong Kong’s eager army of casual watchmakers can respond” (p. 42; The Federation of Hong Kong Watch Trades and Industries Ltd. 1989).

Markets. In 1988, the Hong Kong watch industry exported 329 million watches valued at HK$12,374 million (latest year of complete information; Hong Kong Trade Development Council 1989). Market shares among Hong Kong’s major trading partners have remained quite constant over time. As of 1988, the country’s major markets by value and volume of exports were (in descending order): the U.S., Germany, Japan, and other European countries (Hong Kong Trade Development Council 1989). Approximately 70 percent of this output consisted of electronic watches; of those, 61 percent were quartz analogs.

A portion of Hong Kong’s watch industry consists of parts exports. Seventy percent of watch parts are sold to China, with the residuals split between Switzerland and the U.S. (Hong Kong Trade Development Council 1989, Table 2). Watch cases and parts constitute 14 percent of total industry exports. Major markets for these products include China (32%), India (8%), Switzerland (10%), and Japan (11%).

Foreign ownership of production operations. Overseas investment in Hong Kong watchmaking constitutes a relatively small share of the total industry. Approximately 16 percent of employment is in foreign-owned plants. Investments in watch manufacturing constitute 6 percent of all foreign direct investment in Hong Kong manufacturing. Japan is the major foreign investor, accounting for more than one-half of all foreign employment and 80 percent of foreign capital invested in the watch industry.

Competition. Hong Kong dominates the low-end watch market segment. The nation has no rivals for market share in the price ranges in which the majority of its products compete. Prior to 1987 (when the yen was one-half its current value), Japanese producers made a foray into the low-priced end of the electronic watch industry. Anticipating increased market share, two of the three major Japanese watchmakers set up assembly plants in Hong Kong to manufacture their low-cost products. Even technology-touting Japanese Seiko uses Hong Kong as a low-wage flexible labor location for the assembly of new products. This has become all the more important as the yen has continued to rise in value.

Devaluation of other Asian and Latin American currencies has proved to be a boon for Hong Kong watch producers. Whereas previously a consumer might have bought a Seiko low- to medium-priced watch (because of its quality), price differences between Japanese and Hong Kong products have singularly eroded Japan’s market share in Newly Industrialized Countries (NICs).

There is no reliable information comparing the success of medium-priced Hong Kong watch companies with Seiko (the traditional market leader in this
segment). A Japanese industry representative indicated that this market is unstable, particularly among customers in NICS. Again, the value of the yen has pushed Japanese watches out of reach, and customers are increasingly turning to Hong Kong watches as a price-competitive alternative.

The Swiss maintain control of the medium-high and high-end luxury market. Interestingly, as the value of the yen has increased, medium-priced Swiss watch demand has benefitted. In Asia, the Swiss name still connotes quality, luxury, and status. Even in Japan, consumers prefer Swiss watches at the upper end of the medium price range. Thus the Japanese are caught in the middle: Swiss producers are eroding their middle- to high-end market share, and Hong Kong producers are both walking away with the lower end and making inroads in the medium- to low-end segment (including low-priced jeweled watches). The possibility exists that new innovations—such as a wrist computer—will substantially alter existing watch manufacturing countries’ market shares. In particular, anecdotal evidence suggests that Japan’s solution to eroding market share and stagnating demand is the development of new core capabilities associated with information technologies in watch- and non-watch-related products. However, Hong Kong’s demonstrated ability to rapidly copy new industry developments may circumscribe Japanese producers’ ability to control all segments of potential new product markets.

Why Hong Kong has been able to dominate the low end of the market is an interesting question. In the late 1970s, perceived profits in watchmaking were low; thus, other NICs chose to ignore watches as a target sector. There is some production capacity in Thailand, the Philippines, Malaysia, Taiwan, South Korea, and China. None yet has a serious watch industry. China could eventually prove a serious competitor for the very low-end mass watch. The country already has significant production capacity for standardized mechanical watches and is beginning to develop quartz manufacturing capacity. Much of the other nations’ watch industries consist of the manufacture of brand-name copies. This is a particularly vexing problem for the Hong Kong industry because these products are often sold to tourists visiting Hong Kong. Hong Kong industry representatives indicated that much less copying is going on in Hong Kong today. Yet imported copies are still sold on the island. With its tourist trade, Hong Kong has a large market, so the effects of illegal watch sales are serious.

Imports. Although Hong Kong has a significant and modern watch case and band industry, the majority of watch parts are still imported. In 1988, Hong Kong imported watches and clocks valued at HK$10,000 million (95% of which were watch components). It is difficult to develop a precise accounting of watch-movement imports. Anecdotal information from the Hong Kong Trade Development Council indicates that 50 percent of the movements come from Japan, and an additional 30 percent from Switzerland. The residual comes from
other Asian nations and the Soviet Union. Hong Kong is the second largest importer of Swiss watch movements behind the U.S. Of U.S. imports of Swiss movements, a large portion end up in Hong Kong assembled into watches for American OEMs.

The Hong Kong industry is the epitome of watchmaking today. With increases in the speed of new design and product development, industry emphasis is on fashion and impermanence. Hong Kong watch producers tout their ability to produce batches of watches in 25 to 60 days. This is considerably faster than other competitors such as the Japanese (one year, design to development) and the Swiss (two to three years). However, there is some question whether rapid delivery constitutes new design or superficial product differentiation in conjunction with a standard watch movement.

For now, Hong Kong producers occupy a very large market segment—low-end watch sales. Until 1985, Japanese firms were somewhat successful in competing in this market. But since the yen’s appreciation, the Japanese have been losing low-end market share throughout Southeast Asia at an alarming rate. Customers are both unwilling and unable to buy one expensive Japanese watch when, for one-fifth of the price, they can own two or three different watches. Needless to say, Japanese firms are concerned about lost market share.

Since the early 1980s, the Swiss have retaken a position in the low-price segment of the industry. The creation of the Swatch is attributed with saving the Swiss watch industry. It is unclear whether Hong Kong watch assemblers compete directly with Swatch. While one of the largest Hong Kong watch assemblers sells a plastic watch (Sellux), it is judged to be quite different and with a different price point than the Swatch.

Discussion with Swiss distributors indicated that Hong Kong producers are not currently presenting competitive problems. If anything, the rising value of the yen has given medium-priced Swiss watchmakers a larger share of this market. When asked whether Swiss watchmakers should expand into other market segments, wholesalers and retailers were adamant that Swiss producers should concentrate on what they do best: manufacture medium- to high-priced watches. It also was suggested that output was not meeting demand in Asian Pacific countries.

Problems Facing the Industry

Current labor shortages. We have established that the Hong Kong watch industry’s manufacturing flexibility stems from its dependence on labor-intensive operations. Decreases in the labor supply may seriously limit this mode of production. Shortages are due primarily to industry trends. In the past, the only jobs available were in manufacturing. But today, the population of Hong Kong
has achieved higher levels of education, and the City of Hong Kong has emerged as an important international center of trade and finance. Employment alternatives abound even for less skilled workers. For example, service industries that generally pay higher wages and provide better working conditions than manufacturing have been successful in attracting former manufacturing laborers (Lui and Chiu 1994).

Although watchmaking is among the highest paid manufacturing jobs in Hong Kong, wages are at best only US$20 per day (Hong Kong Government Industry Department 1985). Craftsmen make slightly more than double the base wage, and this is for work in registered factories. A significant component of watch assembly still occurs in workers' homes. Even without published statistics, it seems safe to assume that wages in this segment are lower than those earned in factories.

Labor force lacks skills. The lack of skilled manufacturing workers has always been a problem in Hong Kong. It is especially acute in watchmaking, which requires designers as well as manufacturing staff (Hong Kong Government Industry Department 1985; Hong Kong Trade Development Council 1989). Only two polytechnical schools in Hong Kong train students in horological design. Although these schools have produced a number of graduates recognized by the Hong Kong Watch Industry Association, there are still very few local high-fashion watch designers. The situation certainly improved in the last ten years, but a member of the industry indicated that there are really only two or three reputable watch designers in Hong Kong. To overcome the lack of local talent, many companies contract with Europeans for design services. For example, a large proportion of fashion watches are designed in Europe and assembled in Hong Kong. The vast majority of Hong Kong product designs are variations of those developed elsewhere.

A longer term problem relates to two issues: existing labor shortages (both skilled and unskilled) and the inability to make critical watch components. Until recently, the watch industry defied the industry trend toward offshore labor-intensive production. But as land and labor shortages have developed, more assembly is occurring offshore in China.

While this spatial division of labor helps maintain low prices, higher reject rates and quality control are increasing problems. Certainly with this development there is even less incentive for Hong Kong manufacturers to improve production technology through capital investment. As long as China proves a viable alternative for solving the labor-force problem, Hong Kong producers will remain reluctant to invest in labor-saving equipment.

The second problem stems from industry dependence on foreign components. Since its origin, the Hong Kong watch industry has relied on foreign suppliers for movements and critical watch components. This dependence is tolerable as
long as trade relations among movement-producing countries and Hong Kong remain stable. However, Japanese and Swiss component producers are manufacturing at capacity (Hong Kong Government Industry Department 1990, 1993). In 1989, component shortages increased delivery times from 45 to 120 days (Hong Kong Watch Distributors Association 1989). Reliance on uncertain supply sources makes Hong Kong watch producers vulnerable to unpredictable changes in global demand for watch components.

Unless Hong Kong develops a movement component industry, there is a longer-term problem: the nation may never capture the benefits of cross fertilization of technologies within and outside watchmaking. The industry’s goal (at least on the surface) is to move upscale and away from dependence on foreign suppliers. Yet Hong Kong continues to import the brains of the watch and engages in the least technical, most labor-intensive aspects of production. Upgrading is unlikely unless watch producers make the commitment to invest in the technology to manufacture movements.

The structure of Hong Kong manufacturing has come back to haunt the watch industry. While flexible and able to switch models rapidly, there is no encouragement of the design development or manufacturing knowledge needed to introduce reputable brand names and move upscale. Industry watchers contend that for Hong Kong to make enduring inroads into watchmaking and stave off future competition from other low-wage countries, manufacturers must reduce variety, increase quality, and create an image with staying power.

However, Hong Kong’s production system thwarts such development. While the trade association calls for industry-wide improvements, exhortations are largely ignored by all but large firms capable of investing in new technology (and most likely to benefit from compliance). Because the industry is mainly composed of small firms, larger firms cannot ensure that trade association advice will be heeded. Unless the old system is changed, it seems doubtful that industry aspirations will ever be realized.

There is some evidence that the larger firms are beginning to circumvent the problems of low quality and low prices. In recent years, major Hong Kong brand-name firms have pressed to move upmarket through the acquisition of Swiss watch brand names. This has been of major concern to the Swiss watch industry, particularly given that Hong Kong no longer adheres to international trade law regarding point of origin linked to point of assembly. The significance and effectiveness of this trend is unknown.

**Patent disputes.** Skill shortages and limited design capacity lead to another problem: patent infringement and the lack of identifiable brand names. Since its origin, the Hong Kong watch industry has been criticized for copying watch designs from other countries’ firms. In the early 1980s, RCA of America accused Hong Kong manufacturing of infringing on its patent for LCD design
and circuitry. During the same period, the Swiss also claimed that Hong Kong producers were essentially copying Swiss watch designs (Hong Kong Government Industry Department 1985). Even more recently, Hong Kong producers were publicly embarrassed at the Basel Watch Fair when Swiss and French watchmakers openly accused them of copying European designs.

Hong Kong manufacturers have attempted to overcome this problem. For example, the Productivity Council regularly publishes a booklet on the latest developments in watch design, development, and marketing. Included in each volume is a description of important designs and patents to which individuals or countries have original claims (Hong Kong Productivity Council 1988). This effort is aimed at informing Hong Kong watchmakers to help them reduce problems of patent infringement.

Industry trade representatives acknowledge watchmakers' lack of enthusiasm for government programs. While industry leaders note the importance of improving product design, the myriad small watch producers resist such entreaties. Improving designs means paying more attention to detail and using higher quality inputs. Small firms may not be in a position to do this. Moreover, the elaborate system of subcontracted assembly makes policing such efforts almost impossible. Thus despite concerted efforts, Hong Kong's larger firms are unable to coerce the smaller and more price-sensitive producers to restrict copying. National government efforts are impressive, but the cut-throat nature of the industry reduces the effectiveness of such programs.

The industry trade organization has also initiated a number of programs to overcome the copying problem. In 1984, the Hong Kong Watch Manufacturers Association set up a Patent Depository for logging designs. The depository's records provide the basis to dispute claims made by countries against the Hong Kong watch industry. A committee of Hong Kong and Swiss watchmakers was set up in 1984 to improve relations among watch producers from both countries.

What the government hopes to achieve with one set of programs, however, is often diminished by the effects of other policies. Hong Kong trade policy implicitly encourages copying. With no import restrictions, individuals can travel to other countries, buy copies of European watches, and then sell them either in Hong Kong or within other free trade nations. The reverse is also true. Merchants export copies manufactured in Hong Kong to other countries. The chain linking manufacturing, wholesaling, and retailing is broken in several places, allowing distribution of counterfeit watches. While industry representatives say Hong Kong watchmakers are trying to improve their image, wholesalers are not above buying contraband watches assembled in other Asian nations.

*Intra-industry competition.* The industry's view of the reasons for the success of watchmaking includes several factors. The Hong Kong laissez-faire economic system has enabled producers to operate virtually unencumbered by
rules and regulations. A stable exchange rate (pegged to the dollar) has ensured that as the value of competitors’ currency has gone up, Hong Kong producers have benefitted from a cheaper dollar (The Federation of Hong Kong Watch Trades and Industries Ltd. 1989).

Industry success is also tied to an incredibly flexible production system. While industry representatives hint about improvements in quality and control, they still acknowledge that the average plant size is falling, and the system remains highly fragmented by rampant price-cutting (1993). Noting the industry’s strength through competition, representatives also acknowledge that the level of competition in the watch industry is extreme. Because of the ready availability of imported parts and ease of assembly of the final product (particularly digital watches), firms can easily enter the industry. Severe competition and price-cutting have created great instability. Thus, although the laissez-faire system has greatly benefitted watch manufacturers, competitive pressure has gotten out of hand in the recent past.

*Kinks in the distribution chain.* Viewed from another perspective—that of watch distributors—the Hong Kong watch industry still has some distance to travel to overcome problems of design, quality, and marketing (The Federation of Hong Kong Watch Trades and Industries Ltd. 1989). As the industry has moved upscale with better quality designs and higher quality products, industry observers suggest the time has come for firms to develop brand names. This suggestion is somewhat undermined by the fact that customers are still dissatisfied with the quality of Hong Kong watch finishes. Another development on the horizon is the growing number of small orders from fashion boutiques and small retail outlets. Watch companies are receiving conflicting signals from these marketing channels. Boutiques indicate their need for great variety while small retailers call for higher quality on fewer basic designs.

The fragmented nature of current production has serious implications throughout the production and distribution chain. Since the industry is generally undercapitalized, few surplus profits are available for sales incentives and training. Little or no coordination exists between producers and the distribution chain. Manufacturers hand out price reductions on an ad hoc basis. This pits one retail outlet against another. Furthermore, producers rarely listen to retail market information. Retailers on the front line report that customers want higher quality and greater variation within a product line, not unlimited options on one basic style. However, the production system does not respond affirmatively, and the casual system encourages illegal activities that further erode retail market share.
Summary

Over the last 30 years, the Hong Kong watch industry has grown dramatically from almost nothing to one of the world’s largest watch producers. This meteoric rise stems in large part from Hong Kong firms’ ability to fabricate mainly inexpensive high-volume watches for developed nations’ consumer markets.

The industry’s strength lies in its flexible manufacturing system, which produces literally thousands of styles. With hundreds of small Hong Kong watchmakers, overseas buyers face tremendous choices in sourcing non-brand-name products. Most of these inexpensive products are marketed through retail chains and department stores where variety and low price are primary selling points. Increasingly, these outlets are merchandising watches with other fashion accessories. Some clothing designers have added watch lines to their accessory collections (e.g., Liz Claiborne).

But the structure of this production and marketing system encourages high levels of intra-industry competition and volatile profit levels. Ever-decreasing input costs exert downward pressure on price, and the result is lower profit margins. These factors contribute to watch producers’ reluctance to move upscale, invest in technology, and better define market shares.

Thus, Hong Kong watchmaking, like manufacturing in general, is undercapitalized and unable to establish independent products with locally generated designs. This problem is endemic to all of Hong Kong’s industries—garments, toys, electronics, or watches. Merchant/manufacturers are adept at putting together elaborate subcontracting relationships among many different parties. They are less able to respond with a superior product capable of competing in high-value market segments.

Nonetheless, the Hong Kong watch industry is capable of dramatic and rapid change. Large producers are adding capital and new technology to improve design and production quality. Small firms may resist this trend, but they are still likely to feel the effects of larger firms’ efforts to introduce higher quality, standard components. Hong Kong watchmakers can affect the quality of the final product by upgrading watch parts and components. The industry is highly profitable; therefore, producers can afford to buy design elements they might not otherwise be able to obtain locally.

Quality problems are still a serious concern, but watch manufacturers demonstrate tremendous capability to shift with new developments in timekeeping technology. The transition from digital to analog watches occurred in four years. As long as they can buy core technology, Hong Kong watchmakers can quickly take up new product mandates. And because the manufacturing system is highly fragmented and labor-intensive, little capital is lost during periods of technological change.
Movement into low-cost jeweled watches also illustrates Hong Kong industry's ability to innovate. Hong Kong watch manufacturers have no illusions about challenging the high-priced Swiss jeweled watchmakers such as Patek Phillipe. Indeed, they are content to develop and then dominate a profitable niche—low-priced jeweled watches—where they face few challengers. It is currently true that for the price of a good quality medium-priced Swiss watch, consumers can have jewels. This development is worth watching.

Conclusion

Political turmoil and rising production costs have placed great pressures on firms competing in the watch industry. The reversion of Hong Kong to Chinese rule in 1997 has increased uncertainty in this island country. Initially, growing fears about the pending date of transition resulted in capital flight and individuals rushing to establish residency in other countries. Nonetheless, the stability of many facets of daily life in Hong Kong over the last five years has been surprising. International capital continues to flow into the country, particularly in the realm of international financial and business services. The land market remains overheated as companies from around the world establish real estate and office centers to serve the growing economies of the countries of the Pacific Rim.

Over the last five years substantial changes have occurred in the geography of watch manufacturing. Unlike electronics and textiles, watch manufacturing has only recently begun to decentralize production to the mainland. Therefore, watch manufacturers have less capital either at risk or needing to be redeployed. Coincident with changes occurring in Mainland China, Hong Kong's labor costs and availability were deteriorating due to competitive pressures arising from the growth in service industries. Consequently, manufacturers were already searching for alternative sources of low-cost labor. Developments in China are likely to only accelerate manufacturers' efforts to find lower-cost production locations.

Given the profitability of watchmaking, it is doubtful that producers will entirely abandon the industry. The effort to upgrade production persists as manufacturers attempt to move away from the days of low product quality, etc. Telecommunications technologies facilitate firms' ability to transmit design specifications to decentralized production plants. Companies, therefore, have the option of maintaining design in Hong Kong and distributing production mandates to far-flung manufacturing facilities. The near-term result of political uncertainty may be slowing investment in new equipment while alternative geographic options are explored. Will the industry establish its own design and movement capacity? Probably not. The benefits of a labor-based system of flexible
production rest with the ability to put together and take apart production operations quickly with little or no social costs. If anything, the ability to access vast amounts of cheap production labor may simply encourage Hong Kong producers to stay in the watch market's low end and sell in the Asian Pacific region as it develops. It is unlikely that the island's watch assemblers will ever truly challenge the market leaders. Unilaterally changing the international law of origin by Hong Kong will only serve to attract other labor-intensive low-cost producers, such as India, to enter the fray. The development prospects of a labor-intensive flexible production system is probably limited. It is not likely to result in the development of a more sophisticated indigenous capacity to innovate and develop new markets.

NOTES

1. An exception to this trend is cotton spinning, which has developed as one of Hong Kong's primary manufacturing industries.

2. The structure of the watch industry is remarkably similar to that of electronics in Hong Kong. A recent study by the Hong Kong Government Industry Department indicated that many of the structural weaknesses evident in the watch industry are also apparent in electronics. These include lack of local brands and design capacity, a fragmented production structure, and low levels of capital investment

3. As products achieve market success, they are re-evaluated for possible mass production within a vertically integrated setting in Japan.

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