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Pierre-Yves Donzé

Global Competition and Technological Innovation

A New Interpretation of the Watch Crisis, 1970s-1980s

This paper offers a new interpretation of the so-called “watch crisis” of 1975-1985. Until now, historiography has attached great importance to the growth of quartz watch production in Japan as the main factor of the crisis, thus reproducing the discourse of contemporary actors. The comparative analysis of the Swiss and Japanese watch industries since World War II highlights another factor as the basis for the lost competitiveness of Swiss watchmakers: the organization of the production system. Mass production of high-quality mechanical watches made it possible for Japan to establish herself on the world market in competition to Swiss rivals in the early 1960s. The quartz watch (a technology that Swiss watchmakers had mastered as soon as the Japanese had) strengthened the commercial expansion of Japanese watch producers, as is emphasized by the cases of the United States and Hong Kong. Finally, the end of the Bretton Woods financial system led to a strong appreciation of the Swiss franc against the US dollar, compared with the yen, and this also appears to have helped Seiko.

Like other export-oriented industries, the Swiss watch industry has since its origin been very sensitive to the world economic situation, especially to periods of development and high growth following recessions, and to crises characterized by the stagnation of business, a decline in exports and an increase in unemployment and bankruptcies. Yet all crises are not alike. One can distinguish between cyclical crises, due to a fall in demand on foreign markets, on the one hand, and structural crises, resulting from technological change and the advent of foreign newcomers challenging the existence of the watch industry in Switzerland, on the other hand. In the 19th and 20th centuries, the Swiss watch industry experienced two major structural crises, the first in the 1870s

and 1880s, with the adoption of mechanized production in the United States,¹ and the second in the 1970s and 1980s, which is the subject of this paper.

The period of recession and restructuring which characterized the Swiss watch industry during the years 1975-1985 is usually known simply as the “watch crisis” (*crise horlogère* in French). After four decades of nearly uninterrupted growth – the drop in the volume of watch exports during World War II being largely offset by war production for belligerents – the Swiss watch industry went into recession in 1975. Swiss foreign trade statistics perfectly highlight this phenomenon. Indeed, the volume of exports went from 24.2 million pieces in 1950 to 40.9 million in 1960 and peaked at 84.4 million in 1974, before dropping to an annual average of 31.3 million in 1982-1984.² As for the number of workers, it decreased from some 90,000 employees in 1970 to less than 47,000 in 1980.³ During this decade of recession, the Swiss watch industry experienced extensive restructuring, the most well-known instance being the merger in 1983 of the Société suisse de l’industrie horlogère SA (SSIH, bringing together notably Omega and Tissot) and the trust which controlled the production of movements and parts, ASUAG, giving birth to a new company, the Société suisse de microélectronique et d’horlogerie (SMH, Swatch Group since 1998), on the advice of the consultant Nicolas G. Hayek.⁴

Despite the impact and scope of this crisis, and its impact on the history of the Swiss watch industry, it did not generate academic works in business history or in economics treating the origins, mechanisms and consequences of the crisis. This essay therefore aims to contribute to a better understanding of this phenomenon.

To take a fresh look at the origins and the mechanisms of the 1975-1985 watch crisis, we must understand what really happened in Japan and how it has been able to compete with Switzerland in watchmaking since the 1960s. Thus, after a first part dedicated to a short historiographical background, the second part tackles the question of the mass production of high-quality mechanical watches, which appears to have been the key issue in global competition. Subsequently, a third part presents the competition between Switzerland and Japan in Hong Kong and the United States, highlighting the influence of the changes in the international currency system in the early 1970s.

1 On the crisis of the 1870s and the 1880s, see Christophe Koller, *De la lime à la machine. L’industrialisation et l’État au pays de l’horlogerie. Contribution à l’histoire économique et sociale d’une région suisse*, Courrendlin 2003.

2 Département fédéral des douanes, *Statistique du commerce de la Suisse avec l’étranger*, Berne 1950-1984.

3 Convention patronale, *Recensement 2007*, La Chaux-de-Fonds 2008, p. 13.

4 Pierre-Yves Donzé, *Histoire de l’industrie horlogère suisse de Jacques David à Nicolas Hayek (1850-2000)*, Neuchâtel 2008, p. 169-72.

The 1975-1985 crisis in historiography

Most of the authors who tackled the 1975-1985 crisis in the Swiss watch industry highlighted a group of factors (a lack of industrial concentration, the quartz revolution, the high cost of the Swiss franc, the oil shock, etc.) as explanatory elements without showing how they hinged upon each other and led to a crisis, as if their simultaneity sufficed to make them explicative factors. Two works published in the 1980s took up the question of the “watch crisis”. They largely inspired the authors who published on this subject in the 1990s and the 2000s.

The first is the book by Georges Piotet, the outcome of a PhD thesis in social sciences written at the University of Lausanne, in which he analyzed the evolution of the structures of the Swiss watch industry in relation to the question of corporatism.⁵ In an early section of the book devoted to the “period of problems” (p.37-70), he emphasized the difficulties encountered by the watch industry at the beginning of the 1980s. Five factors were highlighted: the industrial structure (numerous smaller enterprises), the technological revolution (quartz watch), international competition, currency instability and a changing economic climate. Yet the author did not offer the reader any general, systemic interpretation of the crisis, limiting himself to successive descriptions of the “main problems encountered that capital, the trade unions and the State tried to solve.”⁶

The second work is the consolidated book on the global history of horology and the measure of time, published in 1983 by Harvard University professor David S. Landes. He devoted an entire chapter to the 1975-1985 crisis in the Swiss watch industry, entitled “The Quartz Revolution”.⁷ He tackled the question of new competitors who challenged the Swiss domination on the world market after World War II. At first, he presented the case of the American company Timex Co. and its system for mass-producing bottom-end mechanical watches, which in the end did not appear as an existential threat to Swiss watchmakers, for unexplained reasons. Finally, it was a technical innovation to the product itself, that is, the quartz watch, which precipitated the crisis. Landes spoke of “a radical transformation of the technology of time measurement [which] resulted in the creation of what still looked like a watch but was in reality a new product.”⁸ Going on to adopt a classical perspective of the history of techniques, he showed how some prototypes were developed in Switzerland, in the United States and in Japan in the late 1960s. However, despite the mastery of this

5 Georges Piotet, *Restructuration industrielle et corporatisme: le cas de l'horlogerie en Suisse, 1974-1987*, Lausanne 1988.

6 Piotet (see note 5), p.70.

7 David S. Landes, *Revolution in Time: Clocks and the Making of the Modern World*, Cambridge 2000 (first edition 1983, French translation 1987), p.364-95.

8 Landes (see note 7), p.367.

new technology, the Swiss watch industry did not embark upon the production of quartz watches: “the only thing lacking was entrepreneurship: the manufacturers of watches were not interested.”⁹ According to Landes, the inability of Swiss watchmakers to adopt new technologies led thus to the 1975-1985 crisis, to the closure of companies and to a drop in employment.

Works published in the following decades that dealt with the question of the 1975-1985 crisis were largely inspired by the works of Piotet and Landes.¹⁰ They emphasized the inability of the Swiss watch industry to adopt a major technological innovation and viewed this as the primary cause of the crisis, which would have been aggravated by the strength of the Swiss franc, a link which however has not been proved. The key problem with these studies, as far as the publications of Piotet and Landes are concerned, is that they did not construct any model explaining the crisis but instead presented some elements primarily related through their simultaneity. In fact, the academic debate on the 1975-1985 watch crisis very largely reflects the opinion the contemporary actors had about their own action, thus carrying an image similar to the one shared in the Swiss collective memory. In this respect, the work of Cécile Aguilhaume on the crisis as viewed through the regional and national press is highly representative of a perspective which reproduced the discourse of actors as an interpretative factor rather than reconstructing the mechanisms of the crisis.¹¹ Landes also relied essentially on the press and the testimony of entrepreneurs and engineers. This traditional image of a major crisis due to the inability of the Swiss watch industry to cope with the quartz revolution is moreover reinforced by the quasi-legend conveyed with regard to Swatch and Nicolas G. Hayek, and since taken up by historians.¹² According to this discourse, it was a providential man, coming from the outside, who relaunched the industry thanks to a new product that conservative manufacturers did not want to produce: a quartz watch made out of plastic. Even if there is a grain of truth to this story, it obscures an essential

9 Landes (see note 7), p.373.

10 See for example François Schaller, *Les crises horlogères, y a-t-il une spécificité?*, in: Catherine Cardinal et al. (eds.), *L'homme et le temps en Suisse de 1291 à 1991*, La Chaux-de-Fonds 1991, p.273-78; Thomas Perret, *Un canton chahuté*, in: Jacques Bujard, Laurent Tissot, *Le Pays de Neuchâtel et son patrimoine horloger*, Chézard-Saint-Martin 2008, p.301-05; Hélène Pasquier, *Une industrie remodelée*, in: Jacques Bujard, Laurent Tissot, *Le Pays de Neuchâtel et son patrimoine horloger*, Chézard-Saint-Martin 2008, p.307-15; Hélène Pasquier, *La “recherche et développement” en horlogerie: acteurs, stratégies et choix technologiques dans l’arc jurassien suisse (1900-1970)*, Neuchâtel 2008.

11 Cécile Aguilhaume, *Les horlogers suisses face à la mondialisation (1968-1983)*, in: Cahiers de RECITS, 2004, p.57-76. See also Thomas Perret, Laurent Tissot et al., *Microtechniques et mutations horlogères. Clairvoyance et ténacité dans l’Arc jurassien. Un siècle de recherche communautaire à Neuchâtel*, Hauterive 2000.

12 Landes (see note 7); David S. Landes, *Swatch! Ou l’horlogerie suisse dans le contexte mondial*, in: Paul Bairoch, Martin Körner (eds.), *La Suisse dans l’économie mondiale*, Genève 1990, p.227-36; Pasquier, *La “recherche et développement”* (see note 10).

feature of the rediscovered competitiveness of the Swiss watch industry: the deep restructuring of its production system. More than a product innovation, a process innovation was at the heart of the lost competitiveness of the Swiss watch industry in the years 1975-1985.

A technological challenge: the mass production of high-quality mechanical watches

The crisis of the years 1975-1985 was indeed due to the unsuitability of the structures of the Swiss watch industry in terms of the acquisition of new technologies and their integration into the production system. However, this was not originally a problem with the conception and manufacturing of a new product (quartz watch), but rather at the level of the organization of the system of mass production. While the historiography has largely addressed innovation-related questions, have authors not distinguished between product innovation and process innovation – a distinction which goes back to Schumpeter¹³ – and have focused on the former.

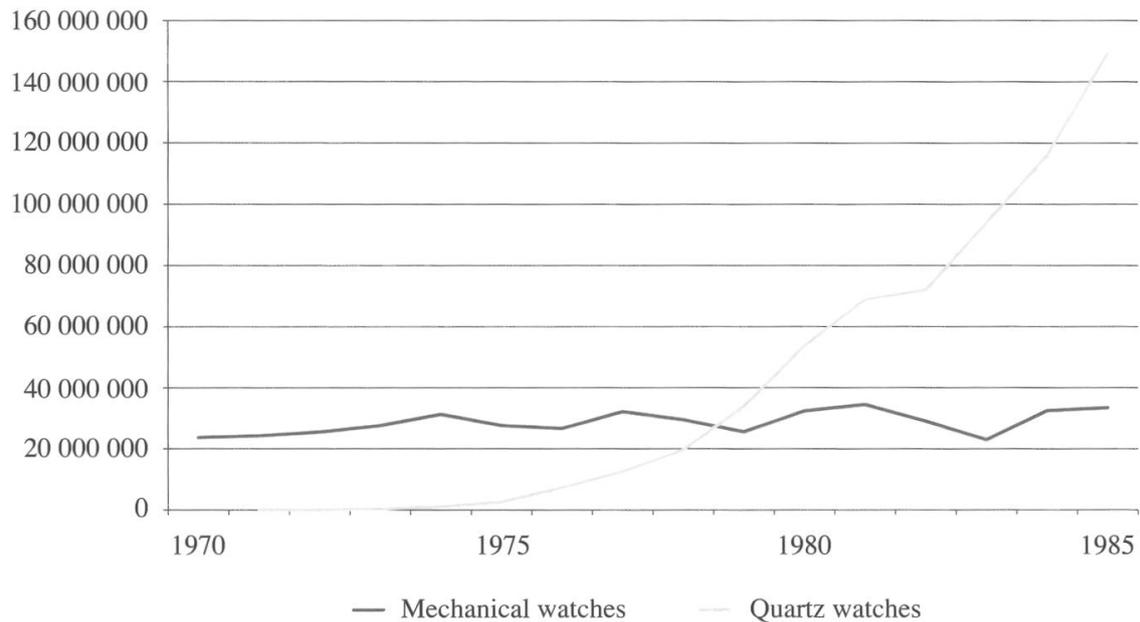
Thus, the overemphasis on objects led historiography to hold the so-called quartz revolution responsible for the 1975-1985 crisis. Comparative analysis with Japanese competitors however highlights a more complex process. On the one hand, the fact that Seiko was the first watch company to launch a quartz watch on the market, at Christmas 1969, does not reflect a technological advantage over its Swiss rivals (Longines, Omega, Ebauches). Rather, it was the fruit of a marketing strategy aimed precisely at establishing its image of a leader in matters of technology and precision.¹⁴ At the time, precision was indeed the key point of Swiss watchmakers' communication strategy. In any case, the Swiss companies soon followed Seiko's lead, and launched their first quartz watches (Girard-Perregaux in 1971, Longines in 1972, Omega in 1973).¹⁵ As a result, the question of primacy and backwardness has no bearing on technological mastery. On the other hand, even if they did promote quartz watches, the Japanese watch companies only gradually shifted to this new product. Figure 1, which represents Japanese national production of both mechanical and quartz watches, calls for two comments. Firstly, production of quartz watches began to grow in the second half of the 1970s. In 1975, it only amounted to 2.6 million pieces, that is, 8.5 per cent of the total. Moreover, until 1978, mechanical watches still accounted for more than half of total watch production. It was only in 1979 that

13 Joseph Schumpeter, *The Theory of Economic Development*, Boston 1934 (first German edition 1912). Product innovation is related to the launch of new products (design, functions), while process innovation concerns production methods.

14 Seiko tokei no sengoshi, Tokyo 1996, p. 154.

15 Pasquier, *La "recherche et développement"* (see note 10), p. 379-90.

Fig. 1: National production of watches in Japan, volume, 1970-1985



Estimates for quartz watches in 1971-1974 based on an extrapolation of Seiko data.
Source: Nihon tokei nenkan [Japan Statistical Yearbook], 1970-1985.

quartz watches overtook mechanical watches in terms of national production, with 33.9 million pieces and 57.0 per cent of the volume. Afterwards, the pace of growth was very fast, with production of quartz watches amounting to 53.8 million pieces (62.4 per cent) in 1980 and 149.3 million (81.7 per cent) in 1985. Secondly, the Japanese watch companies did not stop producing mechanical watches even after they based their growth on quartz watches. Of course, the production of mechanical watches did not continue to grow at such a fast rate as during the 1950s and 1960s, but there was no sharp drop after 1975, as could be seen in Switzerland. Mechanical watches went from 23.8 million pieces in 1970 to 25.6 million in 1980, peaking at 41.8 million in 1986. There was still a market for mechanical watches, and the Japanese were taking it from the Swiss. This shows that the real shift towards quartz watches occurred in Japan after the crisis had begun in Switzerland. Neither the 1975 drop in Swiss watch exports nor the crisis itself can be directly linked to the quartz revolution – even if it reinforced Japan's competitive advantage in the early 1980s – and the crisis in Switzerland.

Rather, we must look for the origins of the crisis in Switzerland in the problem of process innovation. Mechanical watch production indeed underwent a far-reaching change in the 1950s and the 1960s with the adoption of the mass production system, which was however only partially adopted in Switzerland. Until the mid-1980s, a

growing bipolarization could be seen in the Swiss watch industry. On the one hand, quality watches were still manufactured within a production system which was not rationalized. Strengthened and supported by the legislation on the watch cartel, the so-called *Statut horloger* (1934-1971), the dispersion of the industry between numerous independent companies precluded a rationalization of the production of parts and movements.¹⁶ This was above all the case with the manufacturers, which had a legal obligation to produce their own calibers themselves. They were 48 in 1936 and represented the most renowned companies of the industry (Longines, Nardin, Omega, Patek Philippe, Rolex, Tissot, Vacheron Constantin, etc.).¹⁷ This lack of rationalization was also due to the existence of many independent firms and the virtual absence of groups of enterprises, as a result of which each company tried to be active in all the segments of the market and offered a wide range of kind of watches under its own brand. At the beginning of the 1980s, Omega is said to have possessed more than 1600 different models.¹⁸ Even if this extreme case may not be representative of the industry as a whole, it underscores how the absence of rationalization in marketing impacted production.

On the other hand, a mass production system was being introduced for the manufacture of cheap and simple watches (pin-lever watches, also called Roskopf watches). Made in Switzerland since the end of the 19th century,¹⁹ they experienced high growth worldwide after World War II thanks to the introduction of mass production methods. The trend began in the United States in a former munitions manufacturer, Timex Inc. In 1941, two Norwegian immigrants, Thomas Olsen and Joakim Lehmkühl, bought up the Waterbury Clock company which firm produced munitions during the war and was redirected in 1949 towards the mass production of cheap wristwatches.²⁰ Timex became a popular brand of watch sold by the company. The production volume of Timex watches grew from 1 million pieces in 1949 to 8 million in 1960 and 22 million in 1969.²¹ They occupied the bottom end of the range until the late 1970s, when they were replaced by cheaper quartz watches. Competition from Timex on the world market led some Swiss companies to embark upon the production of pin-lever watches. This was particularly the case with Baumgartner Frères

16 On the cartel, Pasquier, La "recherche et développement" (see note 10); Johann Boillat, *Etat et industrie: l'exemple du cartel horloger suisse (1931-1951)*, in: Alain Cortat (ed.), *Entreprises et cartels en Suisse. Etude de cas*, Neuchâtel 2010, p.89-106; Pierre-Yves Donzé, *Un cartel contre les transferts de technologie: l'horlogerie suisse (1900-1970)*, in: Alain Cortat (ed.), *Entreprises et cartels en Suisse. Etude de cas*, Neuchâtel 2010, p.137-63.

17 Pasquier, La "recherche et développement" (see note 10), p.437.

18 *Le Journal de Genève*, October 24, 1987.

19 Frédéric Scheurer, *Les crises de l'industrie horlogère dans le canton de Neuchâtel*, La Neuveville 1914.

20 *International Directory of Company Histories*, vol.25, p.479-82.

21 *Kokusai tokei tsushin*, 1970, p.477.

SA (BFG), at Grenchen.²² It became one of the main Swiss watch companies and opened a subsidiary in Hong Kong in 1970 for the production of pin-lever watches.²³ As for SSIH, in 1971 it acquired a majority stake in Economic Swiss Time Holding, a group founded in 1967 to compete with Timex.²⁴

Thus, although Swiss watch companies mastered in the 1960s the technologies for the mass production of watches, with the exception of the Société des Montres Rolex SA,²⁵ they did not adopt it to manufacture high-quality goods. There was a real gap between quality watches, where production was not rationalized, and cheap mass-produced watches, with both production systems coexisting sometimes within a single company. SSIH is a good example of this duality: in 1973, within the same company pin-lever watches represented 69.6 per cent of the physical volume but only 18.9 per cent of the sales value.²⁶ Yet it was precisely by merging these both models, that is, by mass producing quality watches, that Japanese watchmakers were able to establish themselves on the world market as the challengers of Swiss watchmakers.

The competition with Japan

A quick comparison between Omega and Seiko highlights the existence of fundamentally different production systems (Figure 2). These two firms, founded in 1848 and 1881, respectively, are the biggest watch companies in Switzerland and Japan but their size has varied considerably. Whereas Omega employed 1,040 persons in 1950 and 3,007 in 1970,²⁷ the staff of Seiko amounted to some 3,200 employees in 1950 and 8,900 in 1970.²⁸ In terms of production volume, Seiko had already overtaken its Swiss rival by 1949, and its production had been more than double Omega's since 1953. However, it was especially in the second half of the 1950s that the Japanese firm experienced dramatic growth, reaching a production volume of 3.7 million pieces in 1960 and 14.0 million in 1970. Unlike Omega, this rise was based not on an increase in the number of models but rather on the launch of a very limited number of models that were selected for mass production. Thus, between 1945 and 1967, Seiko marketed only 123 different models – mostly improvements of previous

22 Kokusai (see note 21), p. 477.

23 Jean-François Blanc, *Suisse-Hong Kong, le défi horloger. Innovation technologique et division internationale du travail*, Lausanne 1988, p. 148.

24 Donzé (see note 4), p. 167.

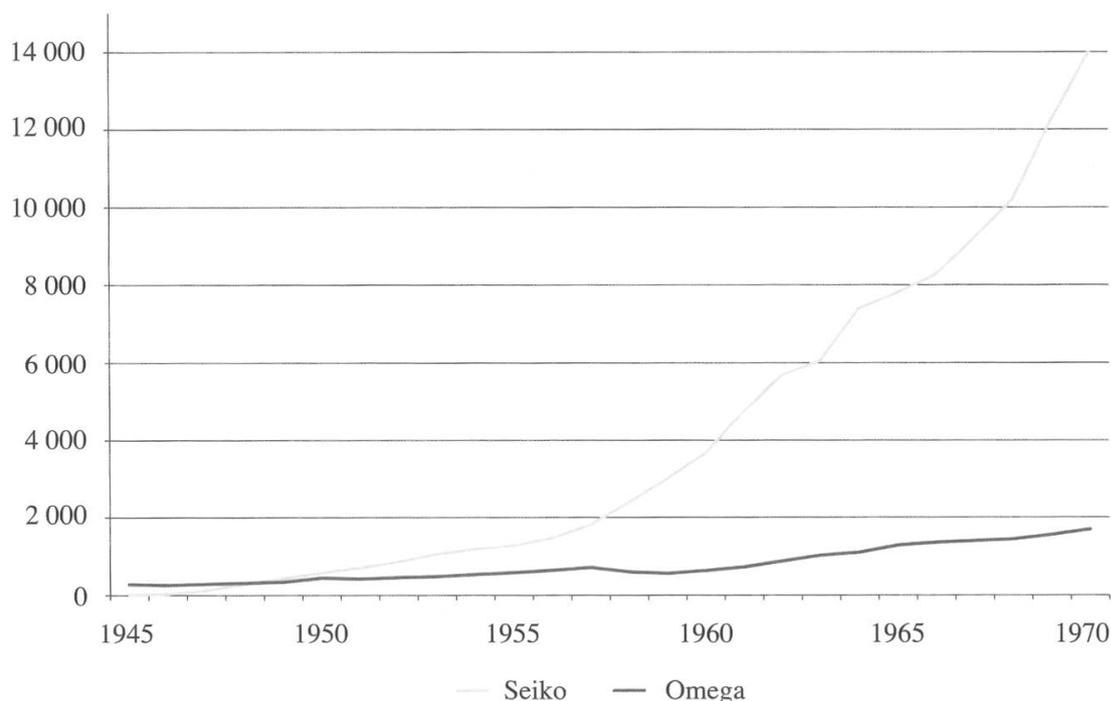
25 Donzé (see note 4), p. 174-76.

26 Rapport annuel de la SSIH, 1973.

27 Pasquier, *La "recherche et développement"* (see note 10), p. 439.

28 These numbers include the employees of the three main companies of the group, i.e. Seikosha (headquarters), Daini Seikosha (watch factory) and Suwa Seikosha (watch factory). These are estimations based on data provided by the Seiko Institute of Horology, Tokyo.

Fig.2: Production of watches by Seiko and Omega, volume, 1945-1970



Source: For Omega, H el ene Pasquier, La “recherche et d veloppement” en horlogerie: acteurs, strat gies et choix technologiques dans l’arc jurassien suisse (1900-1970), Neuch tel 2008, p.440-441; for Seiko, statistics communicated by the Seiko Institute of Horology, Tokyo

models – as compared with several hundred for Omega.²⁹ Moreover, these were not low-end watches. Only in 1971 did Seiko open a factory for the production of pin-lever watches with the aim of countering the inflow of Swiss and American cheap watches onto the Japanese domestic market.³⁰ The engineers of Seiko developed high-quality goods. In 1959, they launched a first self-winding watch, which became the top-end watch after the war,³¹ and went on to mass-produce it: the production volume of self-winding watches manufactured by the company Suwa Seiko – one of the two watch companies of the Seiko group – grew from 430,000 pieces in 1961 to nearly 4.3 million in 1970.³² Moreover, the Japanese firm introduced the mass production system at all its plants, symbolized by the incorporation of conveyor belts into assembly lines in 1958.³³ The triumph encountered by Seiko’s mechanical watches at the *concours* of the observatories of Neuch tel (1967) and Geneva (1968) illustrated

29 Hirano Mitsuo, *Seikoshashi hanashi*, Tokyo 1968, annexes p.32-36.

30 *Nihon keizai shimbun*, October 14, 1971.

31 *Nenpyo de yomu Seiko-epuson*, Tokyo 2001, p.32.

32 Seiko (see note 14), p.96.

33 Seiko (see note 14), p.103.

the success of the production system adopted by Japanese watchmakers.³⁴ Finally, this rationalization of production also made it possible to follow a very rational marketing strategy organized on a global scale (few models, high-density sales network and mass advertising). In this way, high-quality mass-produced watches enabled Japan to challenge Switzerland's domination of the worldwide watch market in the 1960s and the 1970s. Afterwards, since the end of the 1970s, product innovation – quartz watches – reinforced this competitive advantage. The examples of Hong Kong and the United States clearly illustrate this phenomenon.

The first clash: Hong Kong

As a commercial hub in Asia, Hong Kong was one of the first places where Japanese watchmakers undertook their worldwide expansion at the beginning of the 1960s. At the time, the watch market was controlled by the Swiss, who soon encountered the Japanese competitors. Indeed, the situation of the Swiss watch industry in Hong Kong was a virtual monopoly: imports of watches and clocks from Switzerland amounted to 89.1 per cent of the total value in 1960 and to 75.8 per cent in 1965.³⁵ Yet Swiss watchmakers gradually lost market share as the Japanese penetrated this market. Even though imports from Switzerland were still 11.8 times greater than imports from Japan in 1964, this difference fell to 5.7 times in 1965 and to less than 2.0 in 1968. Finally, in 1975, the decline in imports from Switzerland made it possible for Japan to overtake its rival. Afterwards, imports from both countries rose, but Japan outstripped Switzerland.

Initially, Japan's fast growth was not due to quartz watches. Hong Kong's foreign trade statistics for 1975 do not distinguish between watch types, but it seems evident anyway that electronic watches were only a small part of imports from Japan – they amounted to a meager 8.5 per cent of Japanese domestic watch production and were quite expensive products.³⁶ If one considers only finished watches, in 1975 Japan's share of Hong Kong sales amounted to 278.4 million HK\$ as compared to 259.4 HK\$ for Switzerland.³⁷ In the second half of the 1970s, Japan reinforced its position thanks to electronic watches. In 1980, Hong Kong imported finished watches from Japan to the tune of 785.5 million HK\$, of which 64.7 per cent were electronic watches, while Switzerland's share was 695.6 million HK\$, of which only 3.8 per cent were electronic watches.³⁸ Thus, even on a market such as Hong Kong where electronic watches displayed steady growth, Japan's success could be traced to mechanical watches. They made possible the commercial expansion, which was then reinforced

34 Seiko (see note 14), p. 132-33.

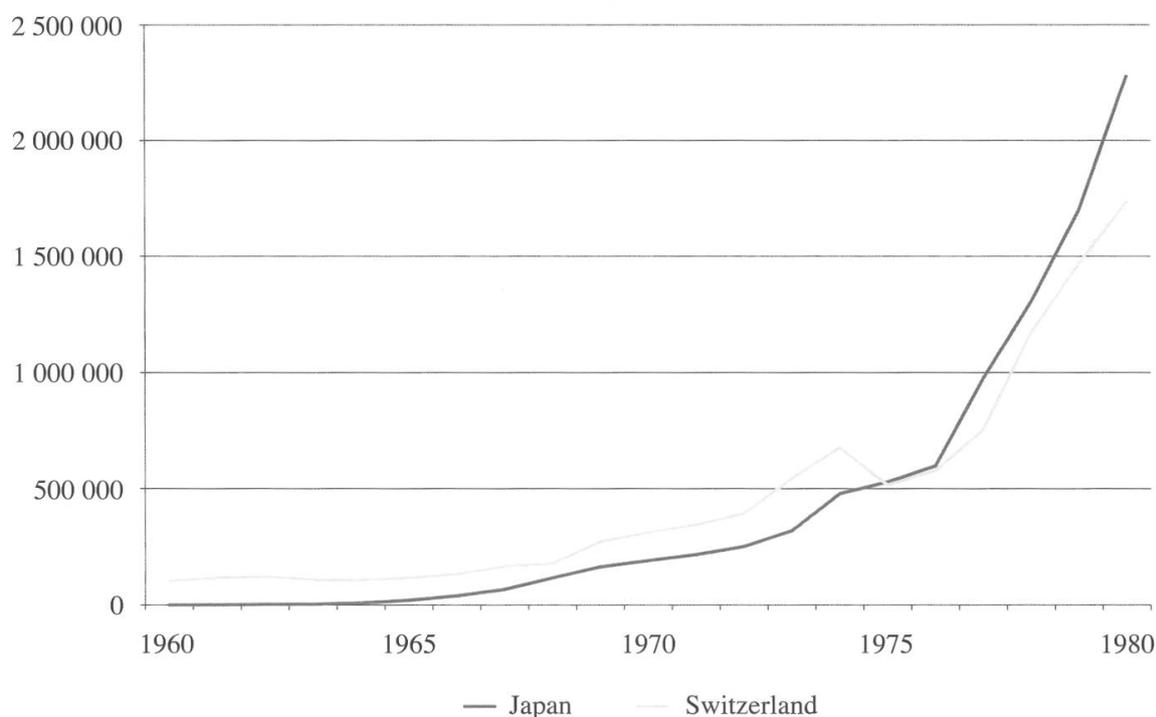
35 Hong Kong Census and Statistics Department, Hong Kong Trade Statistics. Imports, 1960-1965.

36 Nihon tokei nenran 1975.

37 Hong Kong Census, 1975.

38 Hong Kong Census, 1980.

Fig. 3: *Import of watches and clocks in Hong Kong, as thousands of HK\$, 1960-1980*



Source: Hong Kong Census and Statistics Department, Hong Kong Trade Statistics. Imports, 1960-1980.

by quartz watches. The situation was similar elsewhere in the world, particularly in the United States.

The American market

The American watch market perfectly highlights the two-stage expansion of the Japanese watch industry. The US was the world's largest market in the second half of the 20th century. Moreover, the Swiss watch industry was deeply dependent on it, despite the rocky commercial relations between the two countries.³⁹ In the 1950s, America absorbed 35.5 per cent of the volume of watch exports from Switzerland.⁴⁰ Thus, the arrival of Japanese competitors posed a real threat, which in fact was not limited to this market alone but applied to the industry as a whole. Until the mid-1960s, Swiss watchmakers had a monopoly on this market, with 92.2 per cent of

39 Jean-Jacques Bolli, *L'aspect horloger des relations commerciales américano-suisse de 1929 à 1950*, La Chaux-de-Fonds 1956; Dominique Dirlewanger, Sébastien Guex, Gian-Franco Porde none, *La politique commerciale de la Suisse de la Seconde Guerre mondiale à l'entrée au GATT (1945-1966)*, Zurich 2004, especially chapter 4 on the "watch war".

40 Département fédéral des douanes, *Statistique du commerce de la Suisse avec l'étranger*, Berne 1950-1959.

imports of complete watches in the United States in 1965. Japan was nearly absent: that same year, American imports of Japanese watches came to a paltry 74,000 dollars, that is, 0.2 per cent of the total.⁴¹ However, Japanese watchmakers were present on the market through assembly factories set up in the Virgin Islands that belonged to American watch makers and distributors, to whom they provided watch movements from Japan.⁴²

The Japanese watch companies organized their arrival on the American market in the second half of the 1960s.⁴³ Watch imports from Japan increased sharply in comparison to Swiss watches, where growth was much slower (cf. Figure 4). Japanese watch sales reached 2.8 million dollars in 1970, that is, 4.0 per cent of the total, against less than 1 per cent up until 1968. This fast growth continued in the years 1970-1975, when the value of watch imports from Japan increased nearly tenfold, amounting to 26.5 million dollars and representing 17.6 per cent of total imports in 1975. Yet even if American statistics do not allow us to measure this precisely, mechanical watches still accounted for the bulk of imports, as in Hong Kong. This growth was grounded in the high competitiveness of Japanese watches in terms of price and quality, a perfectly planned marketing strategy (advertisement, distribution network, after-sales service) and a favorable exchange rate (see below). Swiss watchmakers soon lost market share to these competitors. Even though imports of Swiss watches continued to increase in absolute terms despite the economic downturn of 1974-1975, the flow was far lighter than it was for Japan. Between 1970 and 1975, the value of imports of Swiss watches did not even double, rising only from 59.6 million dollars to 88.4 million. Moreover, market share plummeted, declining from 83.1 per cent of total imports in 1970 to 58.8 per cent in 1975.

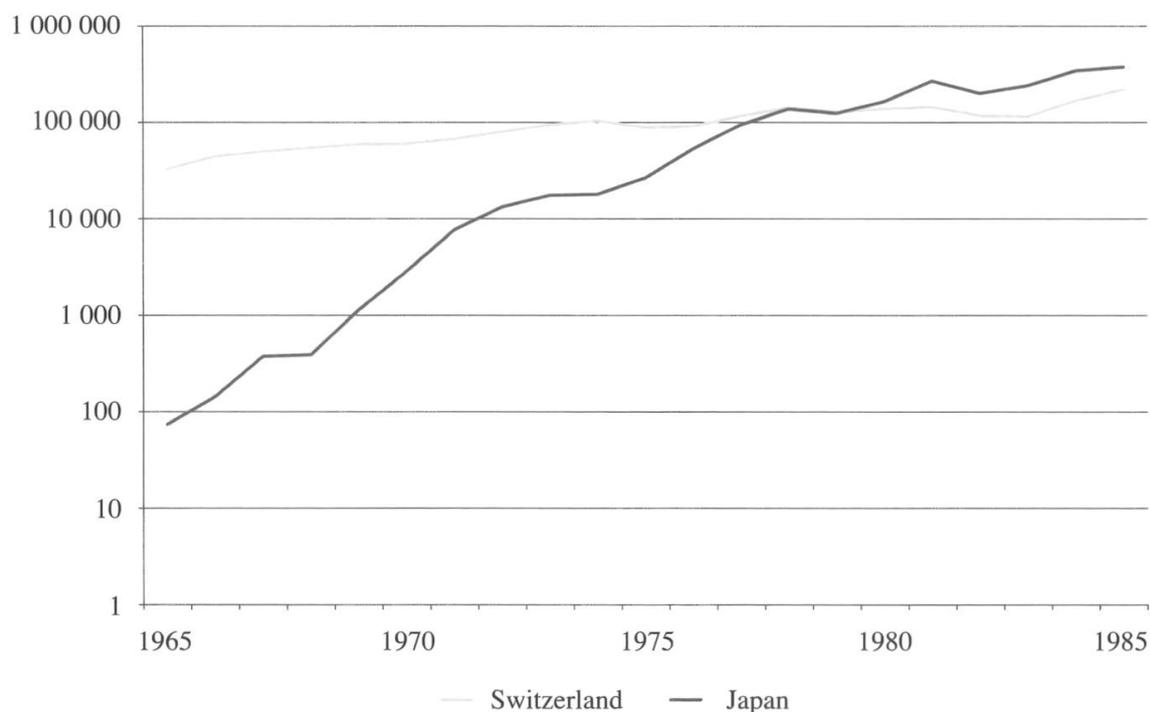
The strong U.S. market growth of 1970-1975 continued and developed further in the following decade. The marketing facilities set up supported the massive sales of quartz watches. Imports of Japanese watches reached 168.2 million dollars in 1980 and 373.4 million in 1985. Japan overtook Switzerland in 1980, when its market share hit 26.5 per cent, then forged ahead with 36.8 per cent in 1985. At the same time, Switzerland entered a period of stagnation, with an average of 127 million dollars for the years 1977-1983 and a market share which dropped to 22.2 per cent in 1980 and to a minimum of 15.3 per cent in 1983. The launch of the Swatch, which was very successful in the United States, obviously explains the comeback in 1984-1985.

41 U.S. Department of Commerce, Bureau of the Census, U.S. Imports commodity by country, Washington 1965.

42 F.-E. Oxtoby, The Role of Political Factors in the Virgin Islands Watch Industry, in: *The Geographical Review* 60 (4) (1970), p. 463-74.

43 Pierre-Yves Donzé, Institutionalizing “useful knowledge”: the Japanese External Trade Organization (JETRO) and the beginning of the Japanese Miracle – the case of the precision machine industry (1945-1960), unpublished working paper given at the Annual Conference of the European Business History Association, University of Glasgow, 27 August 2010.

Fig. 4: Imports of complete watches in the United States, as thousands of dollars, 1965-1985 (logarithmic scale)



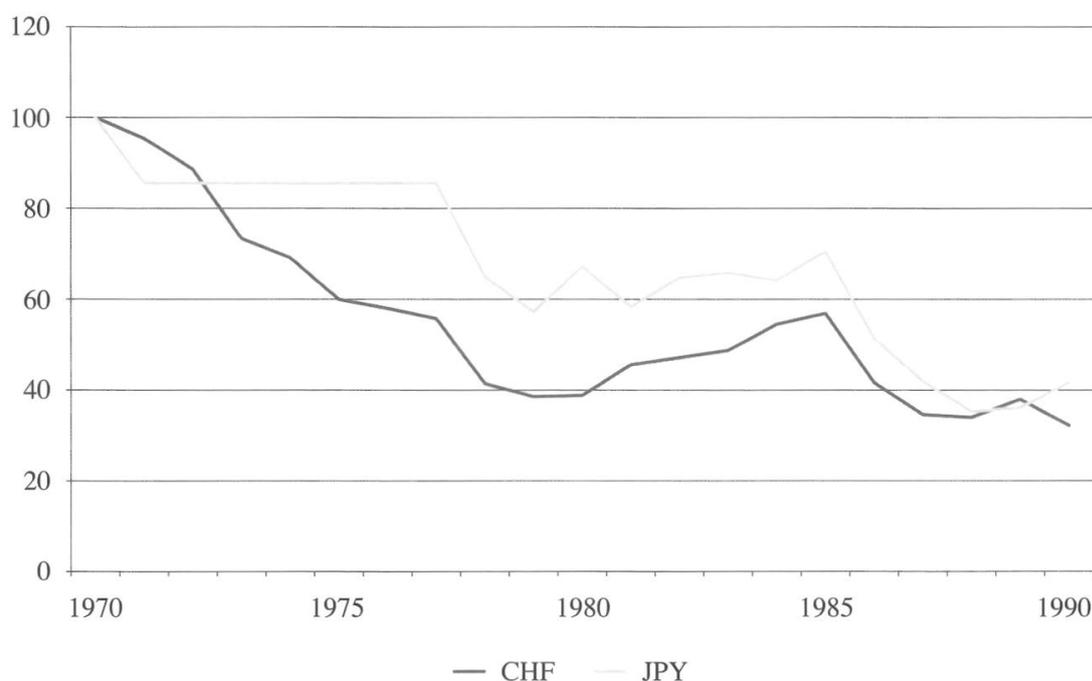
Source: U.S. Department of Commerce, Bureau of the Census, U.S. Imports commodity by country, 1965-1985.

The impact of the liberalization of the monetary system

A final element which historians of the watch industry have hardly tackled in their explanation of the watch crisis and was nonetheless significant: the monetary factor. The historiography has usually emphasized the problem – incidentally omnipresent in archives – but has failed to integrate it into a general explanation of the crisis. A comparative analysis of the exchange rate trends for the Swiss franc and Japanese yen against the US dollar in the 1970s and 1980s helps us understand better the unfavorable impact of the monetary factor for Swiss watchmakers (Figure 5).

The international monetary system experienced a deep shift in 1973 with the end of the fixed currency system and the introduction of a floating exchange rate system. As far as competitiveness was concerned, this change had important consequences for the watch business because it caused the Swiss franc to appreciate sharply, raising the value of Swiss watches on the world market, particularly in the US, precisely at a time when Japanese competitors were growing stronger. Between 1970 and 1979, the dollar lost more than 60 per cent of its value against the Swiss franc. At the same time, however, Japan continued to benefit from a fixed exchange rate with the United

Fig. 5: Exchange rate trends for the Swiss franc (CHF) and the Japanese yen (JPY) against the US dollar (100 = 1970), 1970-1990



Source: For CHF, statistics of the Swiss National Bank (www.snb.ch, accessed 7 July 2010); for JPY, *Nihon chouki toukei souran*, Tokyo: Nihon tokei kyokai, 1988, 18-8.

States until 1977, although the yen was revalued from 360 (its fixed parity since 1949) to 308 yen for 1 dollar in 1971. Obviously, this stability is the major reason why Japanese watchmakers did not suffer from the oil shock: indeed, American imports of Japanese watches grew from 17.9 million dollars in 1974 to 26.5 million in 1975 and 52.9 million in 1976.⁴⁴ After 1977, even though the dollar lost ground against the yen, the drop was less brutal than for the Swiss franc. Until 1985, the difference between both currencies towards the US dollar was extremely favorable for Japan, helping to thereby sustain that country's fast growth on the American market. Following the Plaza Agreements (1985), however the yen firmed up against the dollar and Japan lost a major competitive advantage against Switzerland, especially after 1987, precisely when the restructured Swiss watch industry undertook its reconquest of the world market, with the Swatch benefiting from an exchange rate that had become favorable in relation to the yen.⁴⁵ If one considers the relative size of the American

44 U.S. Department of Commerce, 1974-1976.

45 Kinugawa Megumu, *Nihon no baburu*, Tokyo 2002.

market for the Swiss watch industry, it must be admitted that exchange rate trends are as important a factor as product innovation.

Conclusion

This paper has aimed at a better understanding of the crisis that hit the Swiss watch industry in 1975-1985. Comparative analysis with Switzerland's main rival, Japan, has made it possible to emphasize the complexity of the linkage between crisis, production system, innovation and exchange rates. Finally, it is possible to assert that the quartz revolution was not at the origin of the crisis but rather heightened its impact. Initially, the adoption of the mass production system for mechanical watches and of a rationalized marketing strategy enabled Japanese companies, especially Seiko, to record strong growth between 1960 and the mid-1970s. The examples of Hong Kong and the US showed that Swiss watchmakers were losing market share to this new rival at the time. The lack of rationalization of the production system and an unfavorable dollar-yen exchange rate were their main weaknesses. In the following decade, the Japanese watch industry grew stronger, due to the quartz revolution and a favorable monetary environment. The quartz watch developed along with very effective organizational capabilities, allowing the Japanese watch industry to keep growing on the world market. Despite the quartz watch boom, however, Japan did not move out of mechanical watches until the mid-1980s. Their production peaked at 41.8 million pieces in 1986 before nosediving (23.5 million in 1990 and 19.0 million in 1995).

The reaction of Swiss watchmakers in the mid-1980s – creating the SMH and launching the Swatch (1983) – is especially well known. However, the strategy adopted by Nicolas G. Hayek relied not only on product innovation, but also on deep change in terms of process innovation. The production system was thoroughly restructured, and the mass production system, hitherto limited to cheap watches, was introduced throughout the industry. As an example, one of the most symptomatic measures of this rationalization was the end of the in-firm production of movements by the manufactures Omega (1985) and Longines (1988), in favor of Ebauches SA, which has supplied them ever since. Thus, in the mid-1980s, Swiss watch makers also opted for mass production of high-quality watches, a rationalization process which allowed them to focus on marketing and to orchestrate the comeback of the Swiss watch industry on the world market.

