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**HOW CARTELS STIMULATE INNOVATION AND R&D COOPERATION**  
**THE SWISS CABLE CARTEL AND THE INTERNATIONAL CABLE DEVELOPMENT**  
**CORPORATION**

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**Abstract:**

The purpose of this paper is to demonstrate that a cartel is not necessarily synonymous with a brake on innovation but that, on the contrary, it may become the site of information transfer and technology exchange.

The example chosen is the cable industry, the study being based on the archives of two Swiss cable manufacturers and on those of a Swiss and an international cartel (International Cable Development Corporation).

The cartels studied, which were primarily based on territorial and price protection, allowed for various forms of information and technology transfer: exchange of information in order to rationalise production, exchanges of know-how, exchanges or sales of patents or licences, standardisation of products in order to achieve compatibility between the products of various companies. Finally, the cartel becomes a central player in Research and Development (R&D) in creating test structures and R&D laboratories and in controlling market introduction of innovating products.

The historiography of the last thirty years has tended to consider cartels as an exception, however, as wrote Jeffrey Fear « Yet, until the 1980s, the global story of big business must be told in conjunction with cartels rather than without them »<sup>1</sup>. The purpose of this paper is to look again at one of the aspects of the impact of cartels on the economy.

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<sup>1</sup> FEAR Jeffrey, « Cartels and Competition : Neither Markets nor Hierarchies », Working papers, 07-011. Harvard Business School, 2006.

## 1. INTRODUCTION

The objective of this article is to analyze the effects of a cartel on innovation. This work is based on two companies active in the Swiss cable industry<sup>2</sup>. The hypothesis that we will develop postulates that cartels are not systematically synonyms of a hindrance to innovation, but that, on the contrary, they may become a way to transfer information, promote the exchange of technologies and contribute to the development of R&D of the concerned companies.

In texts on the subject, there are two different approaches to the question of innovation and cartels. The first considers that, “*On the one hand, large firms in concentrated markets are often seen as the main engines of technological progress, for reasons that relate to the optimal scale for R&D and innovation, appropriability conditions, and the presence of financial constraints*”<sup>3</sup>. Indeed, throughout the 20<sup>th</sup> century, several countries have promoted the creation of large monopolistic or oligopolistic companies in order to promote R&D on a large scale. One might therefore conclude that if a cartel develops R&D for its entire industrial sector, it is capable of attaining the suitable scale. Another element that supports this idea is that the firms that participate in a cartel share the risks between them and are therefore more inclined to invest in R&D, which is a high-risk activity.

The second point of view considers that competition promotes R&D, because companies increase their R&D investments in order to gain either larger market shares, for example by developing new products, or a larger profit through the reduction of production costs through the development of R&D. This same train of thought considers that cartelization relieves the pressure of competition and encourages inactivity.

In his doctoral thesis published in 2003, George Symeonidis<sup>4</sup> gave a quite complete review of the texts concerning cartels and innovation.<sup>5</sup> He carried out several studies worth being mentioned here. One of these analyzes interactions between short-term and long-term decisions in oligopolies. Part of this text comes to the conclusion that, if on a short-term basis there is less competition, for example through the action of a cartel, there are more investments in variables such as R&D expenditure on a long-term basis. But other texts have shown that this rule depends on the specification of the technology that is studied<sup>6</sup>.

Another subject of research is that of investment in R&D according to variables linked to the management of companies. One of the results taken from the models studied by Symeonidis is that when companies maximize their profits, this has a negative impact on innovation. We are

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<sup>2</sup> This article is based on an analysis of the archives of the Société Anonyme des Câbleries et Tréfileries de Cossonay (SACT) deposited in the Archives Cantonales Vaudoises at Lausanne (ACV) and on the archives of the Société des Câbles électriques de Cortaillod (SECE) deposited with Nexans Suisse SA in Cortaillod (ASECE).

<sup>3</sup> SYMEONIDIS George, *The Effects of Competition. Cartel Policy and the Evolution of Strategy and Structure in British Industry*, Cambridge MA, London, The MIT Press, 2002, p. 223. Symeonidis is not a partisan of this theory; we are quoting a phrase where he explains its existence.

<sup>4</sup> SYMEONIDIS GEORGE, *The Effects of Competition...*

<sup>5</sup> This is entirely based on Symeonidis, and in particular the text that he cites and that we have not reviewed: SYMEONIDIS George, *The Effects of Competition...*, p. 224.

<sup>6</sup> SYMEONIDIS George, *The Effects of Competition...*, p. 224.

tempted to add, as a hypothesis, that the impact of the cartel on R&D also depends on the positive or negative attitude of the cartel towards the question of maximization of profits.

For these two subjects of research, the theoretical models presented almost always have subtle undertones and it is not possible to come to a clear conclusion. After having reviewed a series of cases through scientific texts on the subject, Symeonidis concludes that other factors influence R&D expenditure. In particular, he cites the technological opportunities (meaning the specificity of branches, some industrial sectors having a higher rate of innovation than others at different times) that would be more influential than the structure of the market or cartelization. Next, Symeonidis approaches this problem through the example of 1950s Great Britain. He compares the effects of the introduction of a law prohibiting the participation of cartels<sup>7</sup> in the concentration, R&D and publicity of companies. For this, he constitutes a series of figures for each industry, before and after the effective date of the law. One of his principal conclusions is that the development of competition had no effect on the rate of innovation. To establish this result, he used the R&D expenditure and the number of innovations produced by the firms as a measurement<sup>8</sup>.

In this work, we have attempted to measure the effects of cartelization on innovation. The question is therefore to examine whether cartels have a positive or negative impact on innovation, as well as on structure and R&D investments. To accomplish this, we studied innovation measures taken by companies involved in a cable cartel.

We examined the cases of two companies involved in cartels, the *Tréfileries et Câbleries de Cossonay* (1898-1987), hereafter referred to as *SACT*, and the *Société des Câbles électriques de Cortaillod* (1868-1970), hereafter referred to as *SECE*. Throughout the 20<sup>th</sup> century, these companies were the two principal cable and electric wire production firms in Switzerland. The two companies alone controlled two-thirds of cable production and 25 to 40% of wire production in Switzerland. Relatively small companies compared to cable manufacturers in other European countries, they each employed 700 to 800 people at the height of the market towards 1970. Their European competitors were either large cable manufacturers active in several countries, as in the case of *Felten & Guillaume*, for example (17 000 employees in 1929, 9 000 in 1931), or companies incorporated in a large group such as *Siemens*, for example, which possessed its own cable manufacturers. This difference in scale implies that the means available for R&D were not identical and that even the idea of R&D differed. In the large groups, whole systems are developed through R&D and research departments are theoretically better equipped to direct extensive work, especially concerning scale and cost distribution.

The two Swiss companies that we examined participated in the creation of two large national cartels: one in the cable industry (electric line cables, telephone cables) and the other in the insulated wire industry, which manufactured all the wires used for buildings, for the machine industry and for household appliances. These two cable manufacturers were also part of an international cartel, the International Cable Development Corporation (ICDC), which incorporated the principal European cable manufacturers since 1928 and later almost all the Asian and American cable manufacturers.

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<sup>7</sup> 1956 Restrictive Trade Practices Act.

<sup>8</sup> SYMEONIDIS George, *The Effects of Competition...*, p. 330.

The first cartel for electric cables was created in 1907 on the request of German manufacturers<sup>9</sup>. It was reinforced in 1928 when an international cartel was formed. As for electric wires, a cartel for the branch existed since the beginning of the 1920s. All these cartels functioned until the 1980s<sup>10</sup>. In the following, we will analyze the effects of these cartels on the R&D of these two companies.

We had access to the archives of Swiss cartels which were found in the archives of the companies we examined. As for the ICDC, the heads of Swiss cable manufacturers presided this cartel and their archives are also maintained in the records of the companies<sup>11</sup>.

Before continuing, it is necessary to state that in Switzerland, cartels were authorized until the mid-1980s. A cartel is considered as a contract that obligates the partners to respect the terms, under penalty of paying indemnities, generally set forth in the contracts. If an agreement is not respected, the members of the cartel can take their case to a public court. Also, in Switzerland, for the most part of the 20th century, boycotting was authorized. Finally, the cartel in question was financially powerful enough to threaten its potential rivals with boycotting<sup>12</sup>.

The point of this work is therefore to study the situation of Swiss cable manufacturers regarding cartels and innovation. Did the cartel promote or rather hinder the innovation and the development of R&D structures and R&D investments?

## 2. THE CARTEL AND TECHNICAL AND FINANCIAL COLLABORATION

In the beginning, the Swiss cable cartel agreements essentially concerned pricing, then, from 1928 forward, a quota was introduced. From the 1940s on, the agreements also concerned technical cooperation. At the international cartel level (ICDC), the agreements first concerned the protection of national markets. In principle, each country was guaranteed that other cable manufacturers would not sell cables on their territory.<sup>13</sup>

After the creation of the Swiss cartel and until the 1940s, the competition between cable manufacturers were essentially based on innovation. Indeed, as there could be no competition on prices and on the market shares defined by the contracts, the cartel companies tried to reduce their costs by developing new techniques. In addition, each one feared that a competitor would develop a major innovation and leave the cartel. Several times throughout the 1930s, one cable manufacturer or another was more advanced than its rival for reasons of technical developments. The clients therefore preferred the cable manufacturer which disposed of the new technology and in these circumstances it was difficult to respect the cartel's quotas. In reality, when a company had the advantage through an innovation and exceeded its rival, it paid a financial compensation to the other members of the cartel<sup>14</sup>. This

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<sup>9</sup> The manufacturers of German cables were organized in a cartel slightly earlier on. They were therefore victims of Swiss competition. This is why they incited the Swiss cable manufacturers to sign an agreement with them. Cf. CORTAT Alain, *Un cartel parfait. Réseaux, R&D et profits dans l'industrie suisse des câbles*, Neuchâtel, Editions Alphil, to be published (2008).

<sup>10</sup> CORTAT Alain, *Un cartel parfait...*

<sup>11</sup> Cf. CORTAT Alain, *Un cartel parfait...*

<sup>12</sup> MARBACH Fritz, *Kartelle, Trusts und Sozialwirtschaft*, A. Francke, 1932, 358 p.; COMMISSION FÉDÉRALE D'ÉTUDE DES PRIX, *Les cartels et la concurrence en Suisse*, Berne, Feuille officielle suisse du commerce, 1957.

<sup>13</sup> With the exception of market shares acquired before the accords, which were guaranteed. CORTAT Alain, *Un cartel parfait...*

<sup>14</sup> Cf. CORTAT Alain, *Un cartel parfait...*

situation of innovation competition incited the cartel, in 1943, to introduce a clause concerning innovation and the obligation of its members to share their innovation if it threatened the stability of the cartel.

An example of this technical competition between cable manufacturers is the oil-filled cable. Towards the end of the 1930s, the large electric companies wanted to install high-tension cables and only the oil-filled cable provided an adequate solution. The company *Câbleries de Brugg* chose to get a *Pirelli* license, whereas the *Société d'exploitation des câbles électriques système Berthoud, Borel et Cie à Cortaillod (SECE)* proposed its own solution. The stakes were high: if only one cable manufacturer succeeded in putting forward its system, the stability of the cartel could be compromised, because the electric companies would prefer the company offering the best technical and financial solution. *Câbleries de Brugg SA* and *SECE* almost took the matter to court, with *Pirelli* accusing *SECE* of using some aspects of its patent. Finally, they arrived at an agreement, and the stability of the cartel was maintained<sup>15</sup>.

The technical cooperation within the cartel developed over approximately forty years, from the mid-1930s to the beginning of the 1970s. It would take on various forms: normalization, the exchange of experiments, the exchange of licenses, joint involvement in all major R&D decisions, the sharing of costs and the creation of joint R&D companies. We will present some examples of this collaboration in the following text.

#### NORMALIZATION

Normalization was the first element of technical cooperation between the cable manufacturers within the cartel. The process was initiated when the cartel contract was renewed in 1943. The contract established that the three cable manufacturers recognize common standards for junction boxes in order to define prices, develop common specifications for suppliers, exchange experiments (principally in the fields of assembly and installation), carry out a few studies and technical tests (lead alloys, anticorrosive protection), and share development work<sup>16</sup>. Formally, the cooperation was to be carried out through meetings between engineers. However, these meetings were rare before the 1960s<sup>17</sup> and all the objectives of the contract were not carried out.

As for normalization, from the 1940s on, the companies established common standards, but the cooperation was reinforced at the end of the 1960s. From then on, the three cable manufacturers manufactured cable boxes according to the same model, using the same abbreviation, BCC (*Brugg, Cortaillod et Cossonay* – from the names of the three companies). They would also take advantage of the opportunity to reduce the number of products. This may seem an anecdotal cooperation; however, it is worth noting that it contributed to a unity of products, processes of fabrication and prices: elements which helped stabilize the cartels<sup>18</sup>.

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<sup>15</sup> ASECE, PVCA 18.12.1935 et séances postérieures.

<sup>16</sup> PP 632/483, PVCSC, 1956-1966, Coopération intercâbleries (Cooperation between cable manufacturers), December 1966. A propos de la convention de 1943 (On the subject of the 1943 convention).

<sup>17</sup> ACV PP 632/182, Séance de discussion concernant les manchons de jonction des câbles (Discussion session concerning sockets of cable junctions) 3 X 150 mm<sup>2</sup> 18 kV from the Geneva IS. Eugène Foretay, 19.11.1954. Report no 54934.

<sup>18</sup> COMBE Emmanuel, *Cartels et ententes*, Paris, PUF, 2004, p. 10. JÜRGENS Ulrich, *Selbstregulierung des Kapitals : Erfahrungen aus d. Kartellbewegung in Deutschland um d. Jahrhundertwende ; zum Verhältnis von Politik u. Ökonomie*, Frankfurt/Main, New York : Campus-Verlag, 1980, p. 98.

## THE OBLIGATION TO SHARE THE BENEFITS OF R&D

From 1943 on, the cartel decided to share the results of R&D. The contract that was signed that year established, in its 9th article, the granting of patents and licenses as soon as "the exploitation of these inventions causes their holder to exceed its quota to the detriment of one or both of the other cable manufacturers<sup>19</sup>". In reality, this cooperation remained limited and the objectives that it announced were never really attained. There was never before the 1960s, as stated in the contract, a granting of licenses.

However, the technical collaboration took on a new dimension when the convention was renewed in 1968. The three cable manufacturers agreed to a closer collaboration: to refrain from introducing new products without the accord of the others, to share patents, to decide jointly on principal R&D investments, etc. The project would be carried out entirely by the partners, through several stages and in several ways.

From then on, the cartel became stronger and stronger in launching products and introducing new processes. This allowed for the limiting of costs and kept any one of the competitors from exceeding the others. Moreover, by slowing down the introduction of an innovation, the cartel could amortize the former installations and, above all, wait until the products were totally perfected and thus avoid unfortunate experiences with some products.

The perfection of a continuous vulcanization production line constitutes an interesting example of the cartel's role. *SACT* was the first cable manufacturer to perfect such a production line, for which it had to obtain the accord of the cartel. In exchange for this accord, *SACT* agreed to share its experiments with the engineers of the other partners of the cartel, which allowed these partners to make their own informed technical choices and improve their procedures<sup>20</sup>. Moreover, in the first stage, *Société anonyme de Câbleries et Tréfileries de Cossonay (SACT)* would have to deliver its products to the two other companies who could also offer them to their clients.

## JOINT INVESTMENTS

From 1968 on, the cartel reinforced technical cooperation. From then on, many investments were taken on jointly. Firstly, the cartel financed external research, carried out by a private institute. Then, it launched joint projects, most notably the establishment of a testing laboratory, until finally the research was taken on entirely by the cartel, which created a company for this purpose, Cabloptic. In this way, optic fibers were entirely developed and manufactured by the cartel and sold to the cable companies which installed them. Hereafter we will analyze a few examples of these partnerships.

### **Externalized joint R&D**

At the end of the 1960s, cable manufacturers wanted to extend the use of plastics to telephone cables which had, until then, been insulated with paper. However, they came up against a

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<sup>19</sup> PP 632/483, PVCSC, 1956-1966, *Coopération intercâbleries (Cooperation between cable manufacturers)*, December 1966. A propos de la convention de 1943 (On the subject of the 1943 convention).

<sup>20</sup> BRUNNER François, *50 ans aux Câbleries et Tréfileries de Cossonay*, At the author's domicile, 1991, [Imprimerie Ramoni, Cossonay-Ville], p. 106.

major problem: when a plastic cable suffered damage, the water would penetrate and be dispersed throughout the length of the cable. The lengths to be repaired were therefore long and the costs high. The clients refused these cables. The advantage of paper cables was that, in case of damage, the paper would swell and block the spreading of the water and therefore limit the damages; but they had other disadvantages, and in particular the cost of their manufacture.

To resolve this problem, the cable manufacturers called upon an American engineering company which had a very good mastery of artificial insulation materials and which had installed a laboratory in Geneva, l'Institut Batelle<sup>21</sup>. The cartel agreed to develop and perfect the "telefloc" with this R&D company. This cable had all the benefits of plastic and paper insulations combined.

The Institut Batelle was mandated in 1970 and worked for several years on the project, from pure research to the perfecting of the manufacturing process<sup>22</sup>. Other projects were also assigned to the institute, either by the cartel or the companies themselves<sup>23</sup>. The cartel would then try to sell the patent for this cable and would thus create a company to commercialize patents, *Propintel SA*, which would be the first joint company of the cartel.

### **Joint test laboratories**

In most manufacturing countries, the large cable manufacturers or energy distributors used life-sized testing stations where cables and their accessories were tested. These tests allowed for the experiments and precious knowledge to be gathered together, which interested the Swiss cable manufacturers. In 1969, the three Swiss manufacturers decided to create this type of center. They would first create an installation to be used for testing cables at an external gas pressure of 220 kV at Birrfeld in 1971.<sup>24</sup> The same year, they would rent an unused substation from the industrial services of Geneva equipped with a high-tension transformer and with all the available equipment. They would carry out several tests and the three partners were privy to all the results<sup>25</sup>.

### **Joint research laboratories and optic cable**

At the end of the 1960s, optic fibers made their appearance as a solution to replace the telephone lines in use. These are transparent fibers capable of transmitting luminous waves and which could replace the copper cables of traditional telephone networks. However, it would be necessary to wait until 1970 for the first optic fiber to be perfected in the laboratories of the firm *Corning* and 1974 for John Macchesney and his colleagues at *Bell Laboratories* to finalize a procedure that would allow for the mass production of optic fibers. At last, the first commercial telephone connection by fiber optics was carried out in the United States in 1977.

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<sup>21</sup> ACV PP 632/200, *Technique de câbles en Europe. Conférence de M. K. S. Wyatt de Philips Dodge devant la Detroit Edison Company, le 29.8.1960. Robert Goldschmidt, 18.11.1960.* Report no 60862.

<sup>22</sup> *Bulletin SACT* (Société anonyme de Câbleries et Tréfileries de Cossonay), spring 1980.

<sup>23</sup> ACV PP 632/234.

<sup>24</sup> Bulletin des Câbleries de Brugg (Câbleries de Brugg bulletin), Cortailod et Cossonay, no 2, 1973, pp. 13-16 et no 1, 1974, p. 2.

<sup>25</sup> *Bulletin SACT* (Société anonyme de Câbleries et Tréfileries de Cossonay), spring 1974.

Faced with this new technology, the Swiss cable cartel came out with an observation unit which included technicians of the three cable manufacturers as soon as the mid-1970s<sup>26</sup>. In October of 1977, the firms decided to create a joint company to develop fiber optics: the company *Cabloptic SA* in Cortaillod. During more than eight years, this company carried out research in the goal of manufacturing the coveted fiber. This development was the largest R&D investment of the cartel. Over a period of eight years, the partners consecrated 21 million francs to the project and, from 1985 to 1987, constructed a new factory at Cortaillod costing 15 million francs to produce the fibers for the three cable manufacturers<sup>27</sup>.

### 3. COOPERATION AT THE INTERNATIONAL CARTEL (ICDC) LEVEL

As we have already discussed, the principle of the international cartel (ICDC) is to reserve national markets to the cable manufacturers of each country. This protection clause limits economic competition and promotes, in certain cases, technical cooperation, most notably the exchanges of experiments and the sales of licenses.

From 1930 to 1938, several European cable manufacturers, including SACT, employed an engineer, Otto Klein, to analyze the performance of each factory. He spent several months per year in each company. He then took the best of the various procedures that he had observed, shared the results of his work and introduced the most efficient procedures into the various factories.<sup>28</sup> In the same way, several times throughout the 1950s, the Swiss cable manufacturers would carry out engineering exchanges with English companies in order to share their experiences.

After WWII, several cable manufacturing groups were constituted for technical collaborations. So, at the end of the 1960s, at the instigation of *Phelps Dodge Industries*, a group was created, *Cabtec*, which united the cable manufacturers *Phelps Dodge Industries* in the United States, in Greece and in South America, the three Swiss cable manufacturers, as well as *Companie générale des Câbles de Lyon*, *Câblerie de Delft* and *Felten & Guillaume* in Germany<sup>29</sup>. These companies constituted work groups whose goal was to improve procedures and products, notably through inspections of the factories and technical meetings. *Cabtec* was created in reaction to the institution of an agreement between *Tréfilmétaux*, *Pirelli* and *Siemens*, under the name of *Trépisie*<sup>30</sup>.

The ICDC also established a technical commission responsible for establishing technical standards<sup>31</sup> and for defining each type of cable and its components in order to establish guidelines for the prices used by the cartel. This work led to a rather thorough normalization of the cables, which promoted the stability of cartel accords<sup>32</sup>.

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<sup>26</sup> *Bulletin SACT* (Société anonyme de Câbleries et Tréfileries de Cossonay), spring 1976.

<sup>27</sup> *Le Toron*, no 28, summer 1979.

<sup>28</sup> ACV PP 632/23, PVCA 17.06.1938. Les Câbles Grammont, which was incorporated in Tréfileries et Laminoirs du Havre SA, were to be found among the other members in the accord.

<sup>29</sup> Other cable manufacturers joined the agreement afterwards.

<sup>30</sup> BRUNNER François, *50 ans aux Câbleries...*, pp. 110, 88.

<sup>31</sup> ACV PP 632/493, Address made by Dr R. Stadler, chairman of the ICDC, at the unofficial meeting of the delegates at Aix-les-Bains, the 05.06.1957. This technical commission was in fact already created as a technical committee in 1956.

<sup>32</sup> For an example of normalization, see: ACV PP 632/493, ICDC, Report of the Working Committee to the Annual Conference 1962, to be held at the Carlton Hotel, Saint-Moritz, on 3rd July 1962, p. 4. Adoption of German VDE standards as a base for the national specifications of other countries.



The existence of the international cartel therefore promoted and accelerated the spreading of innovations. In fact, as it is not possible to sell cables to other countries because of the cartel agreements, the only possibility for making supplementary revenues from an innovation was to rapidly grant a license. The Swiss cable manufacturers therefore bought the licenses to improve their products<sup>33</sup> and then attempted to sell them on; this was notably the case with the telefloc cable, discussed earlier<sup>34</sup>.

Technical cooperation existed not only to improve production; it was also a way of justifying, in the medium term and in the minds of cartel chairmen, the existence of the cartel itself. After the war, public opinion and the political authorities of Western Europe were less and less in favor of the existence of cartels. Almost all the countries established rules of surveillance, then limitation or prohibition. In 1961, Rodolphe Stadler, head of SACT and chairman of the ICDC, clearly states, in his introduction speech at the annual conference of the *International Cable Development Corporation (ICDC)*, that technical cooperation must be used to win the public authorities' support to the cause of cartels<sup>35</sup>.

#### 4. THE LIMITS OF THE CARTEL

The various forms of technical cooperation for which the cartel was responsible and that we have presented up to this point were positive for the companies: they allowed for the exchange of experiments, accelerated the spread of innovations and the sharing of costs. However, the system had its limits. The cartel rule that imposed the authorization of the other partners to introduce a new product had negative effects on the spreading of innovation. In the 1970s, *Société anonyme de Câbleries et Tréfileries de Cossonay (SACT)* developed an insulation cable, EPR (synthetic rubber), and introduced it to the market in 1976. Because of the rules of the cartel, *SACT* had to obtain the authorization of its partners, who accepted, but demanded a higher price. However, this high price was an opportunity for a competitor which was not part of the cartel, and who succeeded in selling his own product. It was only some years later, faced with his success, that the two other partners introduced this type of cable. By then it was too late to catch up on the time lost to the competitor<sup>36</sup>.

Another example illustrates this situation: the appearance of thermo-plastic cables. Up until the beginning of the 1950s, two distinct cartels existed in Switzerland: one for cables and the other for insulated wires. The sharing between these two sectors was quite clear, principally because of the specific manufacturing techniques of each product. The cable manufacturers limited themselves to paper, protected by a lead pipe, whereas the manufacturers of wires produced wires insulated with textile or rubber. However, the development of thermoplastic cables changed everything. When the cable manufacturers equipped themselves for the

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<sup>33</sup> ACV PP 632/199, Report 60814, Robert Goldschmidt, 01.08.1960 (This is an assessment of the company's patents).

<sup>34</sup> We can also cite the case of SACT which, in the 1930s, acquired a patent and attempted to sell it to European cable manufacturers, cf. ACV PP 632/23, PVCA 27.10.1931.

<sup>35</sup> "This is another reason why we should work together in order continually to improve our programme through rationalisation, specialising production and bringing some order into the non-producing country markets ; these measures should result in reduced expenditure, lower cost prices and so a flexible price policy freely adaptable to the changing conditions of modern markets. We can thus win the public authorities to our cause when they realise that our agreements are valuable and necessary, (...)", ACV PP 632/493, ICDC Address by Dr R. Stadler, president, at the Annual Conference, in Helsinki, July 1961.

<sup>36</sup> BRUNNER François, *50 ans aux Câbleries...*, pp. 54-55.

manufacture of plastic cables<sup>37</sup>, they were capable of putting products on the market which had been up to then reserved to manufacturers of wire, and, inversely, the manufacturers of wire were capable of producing low-tension cables, which were part of the monopoly of the three cable manufacturers. Very quickly, the cable manufacturers lost their market shares in low-tension wires; in this way, for the year 1963 alone, they lost 7% of their market shares<sup>38</sup>.

This situation incited François Brunner, chairman of the Swiss insulated wire cartel and member of the Swiss cable cartel, to negotiate an accord with all the manufacturers in the business. The result was the creation, in 1966, of a new cartel which would regulate the production of low-tension wires.

This episode, which appears harmless, perfectly illustrates the difficulties of cartels to survive when their industries go through important innovations, because the innovations often allow for new participants to make an appearance on the market and create competition in a domain that had been reserved to the members of the cartel. In this case, the cable manufacturers managed to save the situation by creating a new cartel, because the companies producing the new cables were involved in other cartel accords with the cable manufacturers. Without this element, it is not certain that the cartel would have been able to limit the competition.

## 5. CONCLUSION

The question is: what were the impacts of cartels on the innovation and the R&D of the companies studied? To find an answer to this question, it is necessary to approach it from several points of view: that of the companies themselves, that of the branch and that of the consumers. For this demonstration, our attention is mainly centered on the companies.

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In view of the various actions undertaken by the cable cartel, it seems that the cartel largely permitted to reduce research costs as well as the manufacturing costs for many products. Two methods were used to attain these objectives: the normalization and standardization of products and the sharing of the benefits of R&D. By normalization and standardization we mean the institution of technical norms and the reduction of the number of products allowing for a limitation of stocks, production costs and research expenditure. As for the sharing of costs, whether through the joint recruitment of an engineer to rationalize production, the joint maintaining of a laboratory, or the joint financing of research, it proves to be attractive. One may effectively believe that it would have been difficult for a single cable manufacturer to assume such investments without risking their profitability. The investments of 36 million francs for optic cable largely exceed the financial capacities of a single Swiss cable manufacturer, without counting the risks of failure. In fact, it is the non-duplication of the R&D effort which allows for the reduction of expenditure for each participating firm<sup>39</sup>. In this sense, the cartel allowed cable manufacturers to adapt to the technology of their branch and promoted the development of R&D.

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<sup>37</sup> ACV PP 632/483, Procès-verbaux des séances du cartel des câbles (Proceedings of the cable cartel sessions), 1956-1966. Document : Rapport sur l'inclusion éventuelle des câbles thermoplastiques dans les contingents et sur la création d'un fonds commun (Report on the eventual inclusion of thermoplastic cables in the quotas and on the creation of a collective fund).

<sup>38</sup> ACV PP 632/24, PVCA 23.11.1964. Brunner report.

<sup>39</sup> RICHARD Frank, *Recherche, invention, et innovation*, Paris, Economica, 1998, p. 94.

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The obligation to submit the introduction of a new product to the authorization of the other members of the cartel poses problems of principle. In view of the various examples analyzed, the cartel often seems to limit or slow the spread of innovations. However, the rapidity of spreading can become fundamental when non-members begin to offer the same product; the emergence of competitors in polyethylene insulation products support this, as the cartel lost part of its market shares because it refused to introduce this product.

However, the opposite is also true: the cartel can promote the spreading of a product. As there is no competition between countries or members of a cartel, there may be an advantage, especially a financial one, in granting patents to other partners and thus accelerating the spread of an innovation. It is inherent that this system is only valid under a certain number of conditions, including, among others, the cartelization of the entire branch, as well as very strong internal constraints obligating the members to respect their accords, to prevent one of the partners from being tempted to leave the cartel and introducing an innovation on its own. It is also necessary to add that in Switzerland the economic community was linked by networks which prevented an entrepreneur from acting alone. To breach an agreement would be to cut oneself off from the economic community, but also to run the risk of the network turning against oneself. In addition, it is important to emphasize the very strong interpenetration between the heads of companies and the banking world<sup>40</sup>. An outsider ran the risk of undergoing economic sanctions if he breached an agreement: being refused a loan, for example.

It was in the interest of the cartel to permit ex-post and ex-ante R&D cooperation without taking great risks. In both cases, each company was assured of always being able to consult the results of R&D research, and, in the case of an ex-ante cooperation, it could also participate in the choice of the research. None of the companies could individually benefit from the collective inventions, because their commercialization remained under cartel control. The rules of the cable cartel – the banning of introducing a new product without the authorization of the other members and the quotas – guaranteed that all the companies would have it in their interests to play fairly and not breach the contract. In addition, the fact that cartels were authorized in Switzerland and that the members of the cartel can take their case to a public court reinforce the stability of cartel agreements and the interest of all sides to cooperate fairly in R&D.

The consequences of the cable cartels regarding innovation are therefore divergent. Its course of action seems relatively positive: by allowing the sharing of expenses and experiments, the cartel promoted innovation and its spread and gave Swiss cable manufacturers the possibility for continuous adaptation. However, while it promoted the spread of one innovation, it also impeded others, which could become problematic if the companies of other branches innovated on products that interfered with those of the cable manufacturing business.

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<sup>40</sup> SCHNYDER Gerhard, LÜPOLD Martin, MACH André, DAVID Thomas, *The Rise and Decline of the Swiss Company Network during the 20th Century*, Université de Lausanne, Institut d'études politiques et internationales, Travaux de science politique, new series, no 22, pp. 17-22. On-line publication: <http://www.unil.ch/webdav/site/iepi/users/epibiri1/public/PaperNo22IEPI.pdf>

3.

Can we broaden these conclusions to other cartels and make a general rule of them? Yes, but only if we apply a strict analysis chart and keep the rule in its context. It is especially important to ask ourselves what the internal constraints inciting the members of a cartel to respect their agreement are. If the constraints are strong enough, the members of the cartel will respect the rules and will not be tempted to attempt a solitary venture. In Switzerland, since the law authorizes cartels, the internal constraints can be very high, which is not the case for all countries. Amongst the other conditions, it is necessary to take into account the structure of the industry, which is to say the number of members and the size of each one compared to the others. The more restrained the number of partners is, the more they are of an identical size and are active in the same sectors, the more the cartel will have its chances to maintain and develop its innovation activities.

It is also necessary to emphasize that the lower the rate of innovations is, the fewer the risks of perturbations are. If the number of innovations rises, one of the partners can be tempted to benefit from a momentary advantage to increase his market shares, or even destroy a competitor; in this case, only very strong internal constraints can keep this from happening. Here we rejoin a premise of George Symeonidis: the effect of cartels on R&D can depend on the intensity of R&D in the sector in which the industry is active. Another danger, inherent in an intense innovation context, resides in the potential appearance of outsiders: chemical companies can begin to manufacture thermoplastic cables. The newcomer must not be too powerful, so that a coordinated cartel action would be able to dissuade him from manufacturing, whether through threat, a lowering of prices, boycott, etc.

In conclusion, and to the contrary of what the economic theory affirms, under certain conditions, cartels promote innovation and the creation of R&D structures. On one hand, if the cartel does not regulate the R&D, it can promote R&D investments, because these represent the only possible competition between the members of the cartel. On the other hand, if the cartel regulates innovation and R&D, it can promote the spread of innovations and experiments and it can reduce the costs and risks of investments. However, this is true only if the cartel does not limit or inhibit the introduction of innovations and if the industry in question has a low intensity of R&D.

These findings should help to revise and reinterpret the recent historiography of other industries in Switzerland including watch-making industry. The story currently admitted says that the crisis of the Swiss watch-making industry in the seventies and eighties would come essentially from the cartelization of the fifties and sixties. According to this story, the watchmakers would not have enough invested in R&D, because they felt protected by the cartel. However, recent studies, including those of H el ene Pasquier<sup>41</sup>, tend to show that watchmakers were very attentive to innovation and that the cartel promoted various forms of cooperation.

We believe that watch-making cartel did not hinder the development of innovation, but has been an obstacle to the development of the structures of this industrial branch. In fact, the

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<sup>41</sup> Pasquier H el ene, *La « recherche et d veloppement » en horlogerie. Acteurs, strat gies et choix technologiques dans l'arc jurassien suisse (1900-1970)*, Neuch tel : Editions Alphil, 2008, 508 p.

cartel has delayed the mergers and the creation of large groups with strong financial bases and capable of conducting an international policy at different levels. Our conclusions about the cable cartel and those of H el ene Pasquier on watch-making industry should lead to review the recent historiography.