Business and Economic History
On-Line

Vol. 1 2003

The Emergence of the French Oil Industry between the Two Wars

Mohamed Sassi

The late emergence of a French oil industry, precisely between the two wars, at first appears to be an economic miracle. It was born from a determination to set up an independent energy policy. France is a country deprived of natural resources and, on the eve of the First World War, its vital need for energy pushed it to give more importance to oil, which explains private initiatives such as the case of Desmarais Frères. In 1914, the French supply of oil was totally dependant on the Majors, particularly on the American company Standard Oil. Although from 1917 Shell was privileged, the problem of the oil industry was not yet resolved. In 1919, the French objective was to recover a part of the interests of the Turkish Petroleum Company (T.P.C.) in the Near East. France recovered the share of the Deutsche Bank and thus created the Compagnie Française des Pétroles (C.F.P.). Born in 1924, the company was to be associated with any preexisting French oil company in order to assure an indisputable majority of national capital. The second important step was the setting-up of the law of 1928 that took care of special export authorizations of the crude and refined oils. The final step was the creation of the refining company (C.F.R.). The state supported the development of the C.F.P. by some institutional arrangements and succeeded in integrating it upstream, by adding the capital of the largest distribution companies and by encouraging the development of their distribution activity. The objective of this study is to try to identify the mechanisms of this successful integration with the international oil markets.

One cannot speak of French oil sources in the plural, because the only well on French soil is at Péchelbronn, in Alsace, discovered in 1745 during the

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I would like to thank my professor Dominique Barjot for intelligent and relevant guidance, Mr. Alain Beltran (Research Director at the Ecole Nationale Supérieure de Cachan) for his scientific and financial support, and Mr Hervé l'Huillier, director of corporate documentary information at Total, for his cheerful assistance. Very special thanks to professor David Schalk at Vassar College for his encouragement and for helping my English language.

URL: http://www.thebhc.org/publications/BEHonline/2003/Sassi.pdf

reign of Louis XV.[1] At that time, the world knew only medicinal uses of oil.[2] However, oil very quickly became a leading source of energy, and the main competitor of gas. About 1800, "a method was discovered of extracting a flammable liquid from the oil, which would replace the vegetable oils used for the lamps at that time."[3] Only in the second half of the nineteenth century were other uses for oil developed.

In 1859, Edwin Laurentine Drake (1819-1880) discovered the first oil deposits in the United States in Pennsylvania.[4] Apart from the small reserve in Péchelbronn, there were no other exploitable sources of oil on French territory, so France turned to the United States, which quickly became the most significant exporter-producer of the time. Given French successes with gas lighting for both residences and streets, oil imports increased rapidly through investment from a few importers, convinced that petroleum products had a brilliant future. The two major firms were Desmarais Frères and Deutsch de la Meurthe. As oil production became one of the defining measures of the power of modern nation-states, France suffered from the absence of an integrated French oil industry that moved from extraction through production and distribution.[5] Economists began comparing the development of countries by the tonnage of petroleum products consumed, and by their methods of consumption.[6]

The same few founding companies have been involved in the French oil industry from the beginning, through periods of difficulty and expansion. In fact, international history shows that the private sector was the primary developer of the oil industry. The history of oil in France is inseparable from the history of these companies, all of which have been subject to enormous changes. These changes often have been fundamental, when state policies altered company structure. These pressures have presented both a threat and an opportunity. The success of any enterprise required adaptation to the new laws controlling the oil market, so the ability to adapt became the indicator of success. The belated but eventually successful emergence of the French oil industry in the interwar period is a tribute to the singularity of the French case.

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[1] Pierre-Louis Maubeuge, Comme une odeur de pétrole, la recherche du pétrole en France des origines à 1945 (Sarreguemines, 1996).

[2] In France, pharmacies sold oil as a remedy for external or internal use under the name of l'huile de Gabian, name of a village of Hérault where the first source of oil was exploited. See Maubeuge, *Comme une odeur de pétrole*.

[3] Dominique Barjot, Annuaire statistique de l'économie française: L'énergie au XIXè et XXè siècle, vol. 2 (Paris, 1991), 19.

[4] Historians agree that the era of the modern oil industry began with the first success of a new oil extraction technique, drilling, on 27 Aug. 1859. The first productive well was 23 meters in depth. In 1859, lamps using colza oil were the primary source of lighting for the French cities and countryside.

[5] Daniel Murat, L'intervention de l'Etat dans le secteur pétroler en France (Paris, 1968), 8-11.

[6] Alain Perrodon, *Le pétrole à travers les ages* (Paris, 1989).

French companies installed an original and effective system. Indeed, we can consider the breakthrough made by the Compagnie Française des Pétroles (C.F.P.), in bringing France to the level of the Anglo-Dutch and American trusts dominating the market at the time, an economic miracle.

My objective is to identify the mechanisms of this successful integration with the international oil markets. I examine the constraints faced by French companies in their efforts to move beyond national borders and establish an international presence, as well as the development of the integrated French oil industry.

From Private Initiative to National Awakening

When the first French imports began in 1861, the U.S. oil industry had progressed dramatically since the discovery of reserves 2 years previously. France was all but devoid of sources of oil, and the difficulty and cost of accessing distant sources were causing problems for the international development of private French companies. By the end of the nineteenth century, the extremely rapid expansion of American Standard Oil of New Jersey and Anglo-Dutch Royal Dutch-Shell increasingly threatened the independence of French industrialists. The complexity of the international market would also have negative repercussions on the internal legislative environment. The principal difficulty remained: how could French entrepreneurs address and efficiently challenge Anglo-American market domination?

Anglo-American Domination of the World Market. In the United States, the formation of an oil holding company was already visible only a few years after the discovery of oil. In 1867, the union of the W and C Rockefeller, Andrews, Harkness, and Flagler companies formed what would become the Standard Oil Company.[7] Standard Oil then assimilated a great number of at least potentially powerful competitors, and drove others out of business.[8] In 1881 alone, it incorporated 39 oil companies.[9] Using all possible means to exclude competition, it rapidly constructed a system of pipelines, and quickly benefited from economies of scale.[10]

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[7] Ralph W. Hidy and Muriel E. Hidy, Pioneering in Big Business, 1882-1911, vol. 1: History of Standard Oil Company (New Jersey) (New York, 1955), 40.

[8] Anthony Sampson, The Seven Sisters: The Great Oil Companies and The World They Made (London, 1975), 23; Daniel Yergin, The Prize, The Epic Quest for Oil, Money and Power (New York, 1991).

[9] P. L'espagnol de la Trameyre, *La lutte mondiale pour le pétrole* (Paris, 1923), 47.

[10] In any commercial activity, two strategies exist: the Differentiation Strategy and the "Cost" Strategy. At the beginning of the oil era, there was a great need for paraffin oil (for lighting), thus, Differentiation was not the most appropriate commercial solution. Rather, it was a matter of dominating the market by the phenomenon well known as "economy of scale," i.e. by reducing the cost. It was

Rockefeller, however, saw his victory as "the result, not of his own ruthlessness, but of the hopeless weakness of the producers who could not control their own industry."[11] The hegemony of Standard Oil would later produce the antitrust movement, but the company, installed very comfortably within the United States, continued its offensive abroad.

Europe saw the foundation, and then the fusion, of Royal-Dutch with the English Shell Transport and Trading Company Ltd.[12] Initially, within the limited framework of their operations in the Far East, they sold their products to the specially created "Asiatic Petroleum Company."[13] Next, in 1907, they set up a fully integrated group: Royal-Dutch held 60 percent of the shares in company subsidiaries, and Shell, 40 percent. Thus, they formed an oil group of international dimensions, possessing diversified resources, using the most advanced techniques of the time, and with a commercial organization that enabled them to enter all the principal world markets. They overtook Standard Oil thanks to their strategic presence in every oil-rich area of the world, despite aggressive competition from their Yankee rivals[14]. Royal Dutch Shell pursued a policy that single-mindedly sought to promote shareholder confidence in order to attract a maximum of capital.

Before the First World War, other holding companies were formed in Russia and the Middle East. In Russia, Ludwig Nobel developed the concept of the first steam-powered seaworthy oil tanker.[15] The first oil

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possible to further decrease initial administrative costs and overhead by increased sales, and an attendant increase in production. Reduction in costs could increase profits. In the early years, Standard Oil (New Jersey) was the first to use this strategy, initially on home soil, and later in the Far East in a price war waged against Royal-Dutch Shell.

[11] Sampson, The Seven Sisters, 24.

[12] The Netherlands was at the same level of development as France at that time. Modern industrialization in the Netherlands took place around 1890. See Dominique Barjot (under the direction of), *Industrialisation and companies in Western Europe at the beginning of the years 1880 at the end of the years 1960: France, Germany-RFA, Italy, the United Kingdom and the Benelux countries,* Editions CNED-CEDES, 1997, p. 151; J. A. Jonge, *De industrialisatie in Nederland tussen 1850 en 1914*, 2 vol. (Nijmegen, 1976). Compare Stephen Howarth, *Sea Shell: The Story of Shell's British Tanker Fleets 1892-1992* (London, 1992).

[13] Its capital was made up by "Royal Dutch"; "Shell Transport"; and Rothschild, which was withdrawn in 1917. See Etienne Dalemont, *L'Industrie du pétrole* (Paris, 1980), 17.

[14] This policy was carried out under the continued aegis of J. B. Kessler and then, from 1900, by Henri Deterding, who took over in 1896. See: Ferry De Goey, "Henry Deterding, Royal Dutch/Shell and the Dutch Market for Petrol, 1902-46," *Business History* 44 (Oct. 2002): 55-84.

[15] The Nobel family founded their company in 1879: the Nobel Brothers Petroleum Production Company Ltd (known also under the abbreviation "Branobel"). See Henrik Schück and Ragnar Sohlman, *Nobel: Dynamit,*

shipment reached London in 1884 on board the *Petrolea*. The Nobels were also the first to install large storage tanks in European ports. The Russian share in the world export grew from 22 percent in 1888 to 29 percent in 1891. By 1900, Russian production exceeded that of the United States for the first time. In the Middle East, with the discovery of the Persian commercial oil deposit of Masjid-i-Sulaiman in 1908, the British took the initiative to form, in April 1909, the Anglo-Persian Oil Company (which would become the Anglo-Iranian in 1935, and British Petroleum in 1954). However, before the First World War, Royal-Dutch-Shell and Standard Oil remained on the front line well ahead of their competition.

Grids that take into account the company's various environmental factors, better represent the strategic position of these two main world actors in the oil markets.[16] Beyond legislative or national constraints hindering rapid expansion of the French petroleum industry, there was the problem of international competition. Standard Oil and Royal Dutch-Shell simply did not grant much space to the French companies.

Standard Oil's Aggressive Strategy. The U.S. company concentrated its activities mainly on the North American continent. At the same time, it adopted a strategy of domination in Europe and the rest of the world through economies of scale. If the anti-monopoly act (the Sherman Anti-Trust Act) passed in 1890 limited its drive for monopolistic control inside the United States, there was little international competition to prevent it from continuing its aggressive marketing policy. On the international level Standard Oil benefited from competitive advantages while supported by its very good financial standing.

The breakthrough of new and significant competitors, such as Royal Dutch-Shell, threatened to upset its extremely advantageous situation. Thus, Standard Oil took maximum advantage of all available opportunities to maintain or reinforce its position on the world market (see Figure 1).

The Presence of Royal Dutch-Shell's Competitive Strategy. Royal Dutch-Shell, a product of a fusion faithful to the Dutch style of making business and the colonial commercial methods of Great Britain, installed stations at

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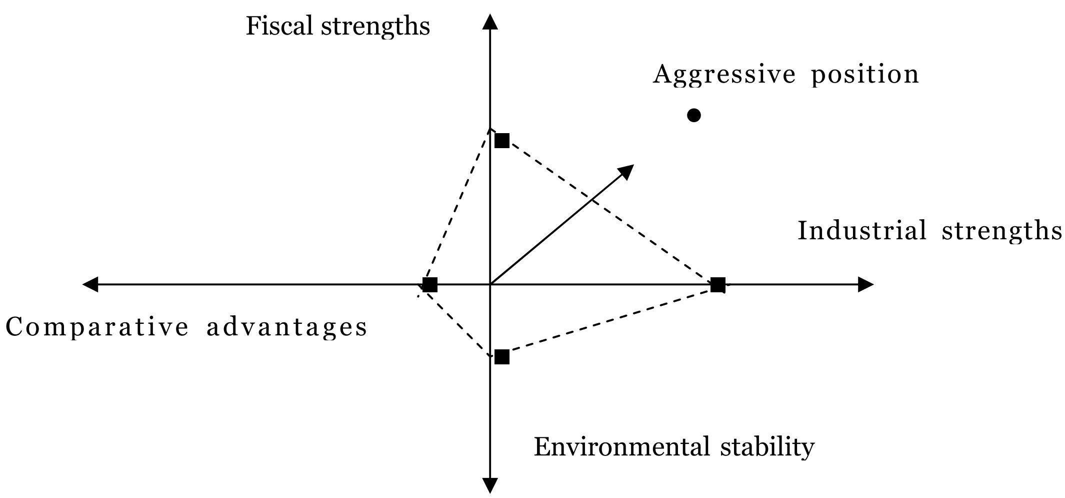
Petroleum, Pazifismus (Leipzig, 1928); James D. Henry, *Thirty-five Years of Oil Transport: The Evolution of the Tank Steamer* (London, 1907).

[16] To determine the strategic position of companies, we make use of a model of strategic evaluation. It is a diagnostic model, prepared by the Chamber of Commerce and Industry in Quebec (Direction of the management of enterprise) and used by managers and to help leaders use an analytical approach for choosing a total strategy for their companies. See **http://www.mic.gouv.qc.ca** (entreprise et commerce/Outils/publications/Outils de gestion).

strategic points all over the world.[17] It penetrated all states, adopting the national color of the countries it wished to "conquer." Its strategy was the diversification of its sources of extraction, which was its major advantage in a difficult competitive environment. It sought to compete with Standard Oil on its own turf. In the United States, it added oil fields; in the Far East, it attempted to fight against Standard Oil in China's famous "price war" of 1910, although its product did not equal Standard Oil's in quality.[18] The result was that Standard Oil gave up 50 percent of its market share to Royal Dutch-Shell. Royal Dutch-Shell sought to invest in increasing productivity and to reduce manufacturing costs to protect its competitive advantage. Figure 2 represents Royal Dutch-Shell's strategic position.

The Insufficient Adaptation of French Industry. From its beginnings, petroleum rapidly became a vital product in the economy of states. In France, although industrial performance was not negligible, domestic demand was weak at the end of the nineteenth century. From 1880 to 1914, growth rates in France remained very low compared to the rest of Western Europe.[19] Oil was a vital need for the national economy if France wanted to remain competitive in Europe.

FIGURE 1
Aggressive Strategic Position of Standard Oil



[17] The allusion here is to Dutch ethics in doing business, referred to as a logic of compromise by Philippe d' Iribarne, *La logique de l'honneur, Gestion des entreprises et traditions nationales* (Paris, 1989), 207-251.
[18] Standard Oil sold refined oil below cost in foreign markets, while maintaining an elevated price in the United States, sheltered by tariff barriers. It cut prices even more in the Far East, 50% lower than in the Netherlands, although the latter market was closer to American oil resources.
[19] Dominique Barjot, Industrialisation et sociétés en Europe occidentale des débuts des années 1880 à la fin des années 1960…, p. 82.

Would France be condemned to have an oil industry unable to face the needs of industrial development, in particular, and the economy, in general? French oil policy, from the birth of the new energy source until the First World War, seemed hesitant and inconsistent. Paradoxically, the economy's need for petroleum products increased without interruption. The lack of a coherent State oil policy as far as was manifest in both the absence of an ambitious State-financed and organized program, and the contradictions reflected in the relevant legislation.

For the period under study, the customs statistics reflect a reticent policy with regard to the supply the crude oil (see Figure 3). The nearly constant fall in imports of crude oil after 1904 represented an earnings loss for French industry, in general. Whereas, from 1895 to 1901, the average imports were 317.000 tons of "French-crude" and 76,000 tons of refined products, from 1906 to 1912 an average of 196,000 tons of crude oil and 423,000 tons of refined products were registered. The evolution of the import totals is weak compared dramatic and rapid development of the automobile industry (see Figure 4).

FIGURE 2
The Competitive Strategic Position of Royal Dutch-Shell

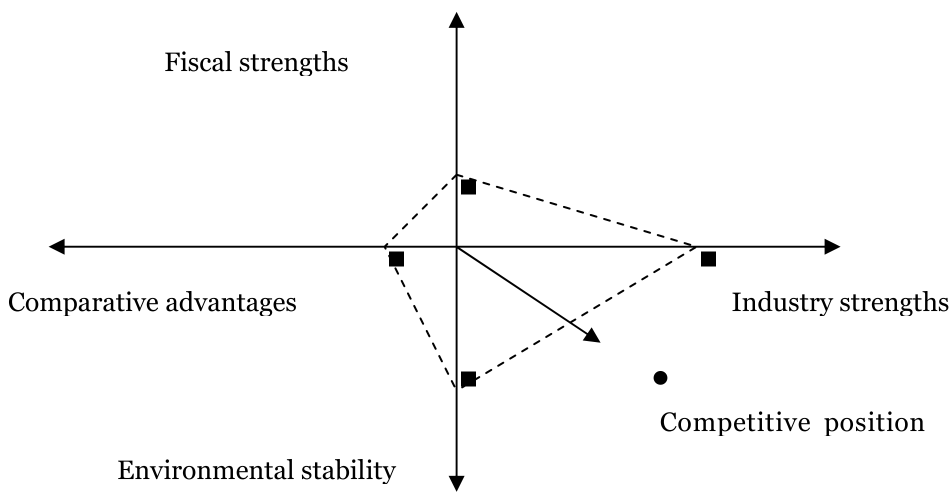
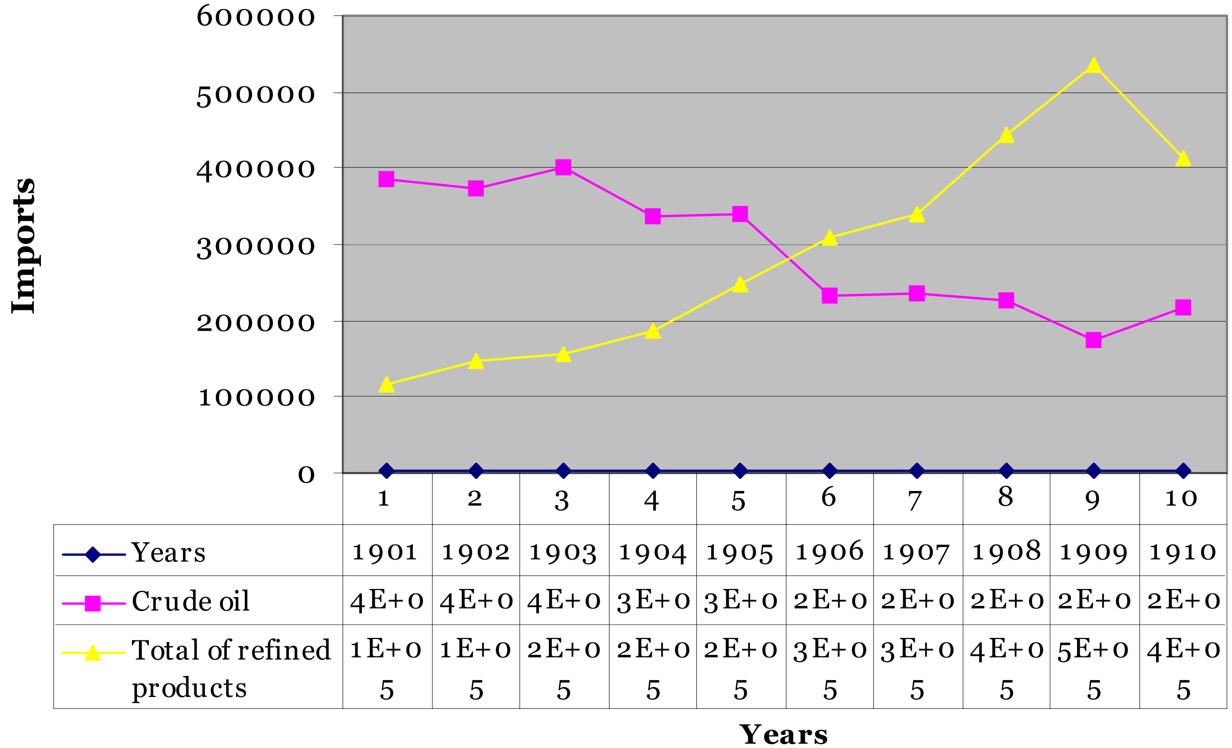
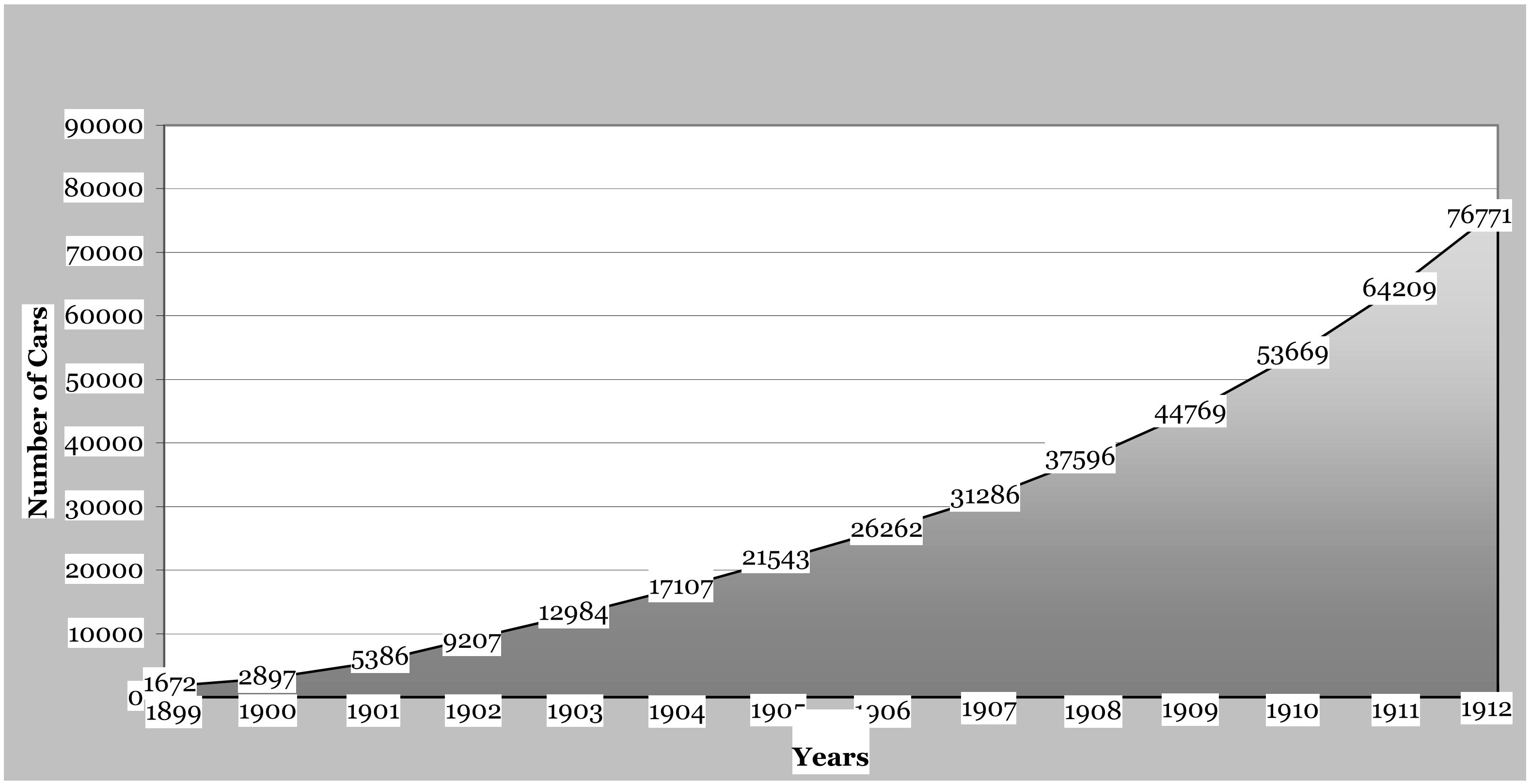


FIGURE 3
Evolution of French Imports from 1901 to 1910 (in tons)



Source: Statistics of the General direction of the Customs, French imports and exports of oil products from 1885 to 1963, Comité Général du Pétrole, September 1964.

FIGURE 4
Evolution of the Number of Cars in France at the Beginning of the 20th Century



Source: André Leroy, *Les redevances pétrolifères. Ce qu'il faut en connaître* (Paris, 1939), 14.

The absence of a French oil industry continued during a historical period when the production of oil, and the national control of that production, became one of the essential elements of power for a modern nation.[20]

At a time when the Anglo-Saxon companies increased their world market domination by utilizing economies of scale, France took legislative measures that largely limited the oil trade. From 1861-1863, the administration of the Second Empire moderately taxed imported refined oil for lighting use. However, it took little time to realize that petroleum products could constitute an ideal source of tax revenue. Thus, the Parliament of the newly established Third Republic decided on July 8, 1871 to increase the tax rates in an attempt to address the disastrous financial consequences of the 1870 war. Taxes represented between 65 and 95 percent of the customs value of crude, or refined oil for lighting use. A law passed on July 26, 1873 increased the taxes on crude oil to between 86 and 160 percent of the customs value, and to 95 to 250 percent of the customs value for refined lighting oil.[21]

The French economy was in a very difficult situation because of the vulnerability of the national oil companies, but the French companies generally adapted rather well. To guarantee their independence from American and British suppliers, some companies sought supplies from other areas of the world. However, given the large size of Standard Oil, efforts to locate other sources were relatively costly. Meanwhile, French companies continued to sell American-refined products to meet the needs for their local market. State protectionism (the law of 1903 in particular) tended to increase to sustain an economic activity that had lost its comparative advantage, pushing French companies to continue selling American-refined products to guarantee their market share. As a result, American producers increased their comparative advantage, making it increasingly difficult for French companies to locate and exploit new oil sources. Reciprocally, the private companies' difficulty increased France's vulnerability as far energy was concerned. In a national crisis, there was no guarantee of a steady, reliable, reasonably-priced supply of petroleum, which had become the lifeblood of all modern states, essential for their national defense.

The French companies, placed in a difficult situation by their government's strict legislation, chose a strategy that made it possible to protect their internal market share and join other small independent companies in defending their external interests. The pressure exerted by Standard Oil and legislative constraints on the French market limited the small French companies' strategic choices. Working together to protect

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[20] Daniel Murat, *L'intervention de l'Etat dans le secteur pétroler en France*, Thèse de Droit, Université de Paris, 1968), 8-11.

[21] Bernard Baffet, "Le raffinage de pétrole en France avant 1919," Revue *L'hydrocarbure*, revue des anciens élèves de l'Ecole des Pétroles et des Moteurs N° 188 (1986).

themselves, the ten largest firms in the French market formed a trust, called "Le cartel des dix" (Cartel of the Ten). This cartel created a French State-supported monopoly of the oil market. The central government seemed to support concentrating power in the hands of a limited number of industrialists and traders in oil products.[22] This cartel aimed to put an end to the risks of competition, while trying to stabilize prices. It was a horizontal cartel, rather than a vertical one, because it joined together companies from the same industrial sector.[23]

Most of these companies had gradually given up refining to concentrate on the distribution and marketing of petroleum products. The top three firms were Desmarais Frères, Deutsch de la Meurthe, and Fenaille et Despaux.[24] These three represented 60 percent of the oil trade in France.[25] Thanks to agreements fixing sales quotas, each company provided for the consumption needs of a particular area. Each week, they determined the price of oil on the market by mutual agreement, ensuring a stable profit. Standard Oil was the exclusive supplier of refined products to the Cartel, and moved to monopolize the provisioning of France and many European countries. In 1914, Standard Oil was the only trust dealing with the French market.

The true competitors were thus the importers of refined oil, the agents of foreign industries who were not taking part in actual production, not stimulating national industrial development by their purchases, and not using any local labor. They were also unable to defend the French market against a foreign attack. The solution for the French petroleum companies was to acquire more control of distribution. In 1874, a group of French refiners including Desmarais Frères acquired a refinery in the United States in Bayonne, New Jersey, close to New York to better resist Standard Oil. The French refiners located trade and information offices at the refinery to facilitate purchasing crude oil, but very soon abandoned these ambitions because of Standard Oil's rapid development of pipelines.

Confronted with Standard Oil's strategy, and a bit later, Royal Dutch-Shell's, the French companies surrounding Desmarais Frères had to adopt a defensive position. Their approach consisted of seeking out alliances; in a way, their inability to compete forced them to accept

[22] Charles-Henri Pomaret, La politique française des combustibles liquides: pétrole, charbon liquide, alcool, le carburant national, Thèse pour le Doctorat, Université de Grenoble, 1922 ; Emile Labarthe, Le pétrole et l'Etat (Paris, 1920).
[23] Dominique Barjot (under the direction of), *Vues nouvelles sur les cartels internationaux (1880-1980)* (Caen, 1994).
[24] Mohamed Sassi, *L'histoire de Desmarais Frères (1861-1965),* mémoire de DEA under the direction of Professeur Dominique Barjot, Université de Paris-Sorbonne (Paris IV), 1999.
[25] Edgar Faure, Le pétrole dans la paix et dans la guerre (Paris, 1939), 62.

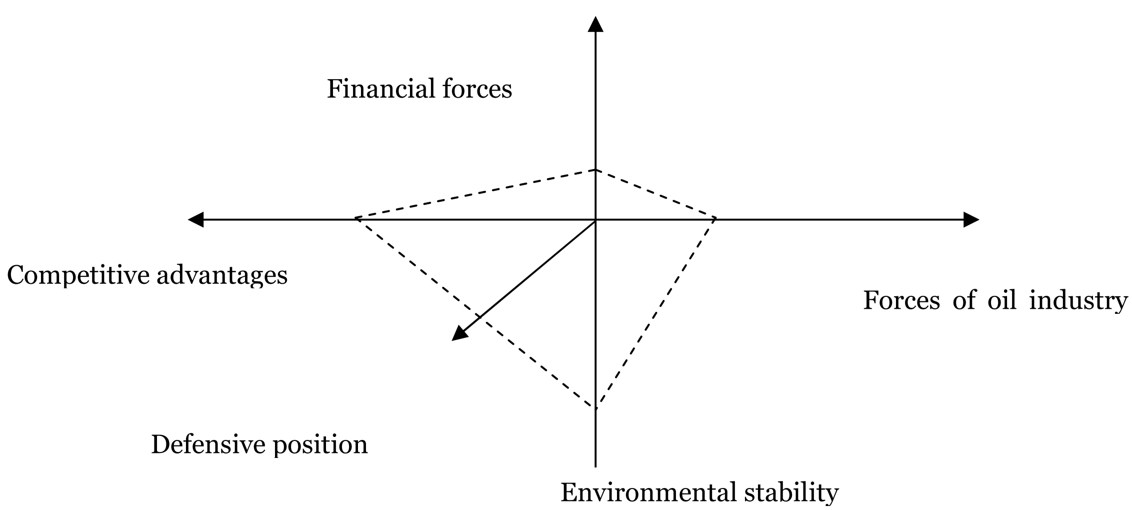
cooperation.[26] Lacking competitive advantages, the omnipresence of the English and American companies exposed their major financial weakness in a very unstable environment (see Figure 5).

From the beginnings of the petroleum industry in France, the largest oil companies tried to monopolize the market, aiming to guarantee their market share. In an attempt to move beyond French soil, the industry leader Desmarais Frères formed a group of French industrialists under its aegis of to try to gain access to various oil reserves throughout the world.

The Shock of the First World War

At the beginning of the nineteenth century, Europe entered the industrial age (sometimes categorized as the First Industrial Revolution) with steam-powered machinery and large-scale industry. By the outset of the First World War in the summer of 1914, petroleum was already an extremely important energy source. The war clarified that some countries were significantly ahead in this sector and emphasized France's vulnerability.

FIGURE 5
Defensive Strategic Position of the French Group of Industrialists[27]



[26] Geoffrey Jones, ed., Coalitions and Collaboration in International Business (Aldershot, U.K., 1993).
[27] According to the model of diagnosis, prepared by the Chamber of Commerce and Industry in Quebec (Direction of the management of company), See: **http://www.mic.gouv.qc.ca**.

The declaration of war revealed French industrial activity's real problems. On August 9, 1914, the main three French companies, Desmarais Frères, Deutsch de la Meurthe, and Fenaille et Despaux, drafted a memorandum to submit to the government to underscore their industry problems.[28] The logistical problems in distributing their stocks of oil and mineral fuels were severe:

> They could carry out [this essential national goal] only if they were immediately given possession of the industrial and commercial means of action of which they had been deprived at the outset of the conflict: tugboats, barges, specialized crewmen, tank cars, horses, wagons and wagoneers, access to the telephone and telegraph systems, and to have restored to their staffs some of the key personnel who had been called up to the armed forces, etc.[29]

The consequences for military and civil fuel provisioning were immediate. The French companies could no longer pay for oil coming from the United States, because various governmental measures had frozen their access to credit. All the productive forces of the State were paralyzed for the moment. The First World War demonstrated powerfully and unequivocally that oil was an essential strategic product for armed forces both land- and sea-based.[30] However, France was completely dependent on its Anglo-Saxon allies.

By the end of 1917, before the final great offensives mounted by the Central Powers in the spring and summer of 1918, France feared that she would not receive sufficient oil supplies from the Americans. The new Prime Minister, George Clemenceau, appointed in November 1917, sent a telegram to the American President, Woodrow Wilson:

> At the decisive moment of this war, when with the year 1918 major military operations get under way on the Western Front, our armies must at no time lack the fuel required for our military trucks, for our aviation, for our mobile field artillery.... If the Allies are not to lose the war, France must be prepared to make a maximum combat effort, and at the moment of the peak of the [expected German] offensive, France must possess the gasoline that will be as necessary as blood in tomorrow's battles.[31]

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[28] Archives of Desmarais Frères (Archives du Monde du Travail de Roubaix), 130 AQ 9.
[29] Ibid.
[30] Roberto Nayberg, *La question pétrolière en France, du point de vue de la défense nationale*, de 1914 à 1928, thèse de doctorate degree in the history of the 20th century, Université de Panthéon Sorbonne–Paris 1, 1983. See also Roberto Nayberg, "Qu'est-ce qu'un produit stratégique? L'exemple du pétrole en France 1914-1918," www.stratisc.org
[31] The text of this letter sent to president Wilson at the end of 1917 figures in the second report (approved by the senatorial Commission of the Army on 11 Jan. 1918) published by Henry Béranger in *le Pétrole et la France*, 59-60. It was also

The United States heard Clemenceau's appeal; in less than 3 weeks, France received more than 40,000 tons of petroleum products.[32] However, France learned some hard lessons from the anguishing hours of 1917-1918, and wanted to increase and reinforce her provisioning.

The origins of this crisis lay in the contradiction between the increasing needs, which necessitated increasing imports, and the scarcity of properly equipped seagoing oil tankers available to satisfy these needs. In order to put an end to this crisis, in particular the key element, the lack of maritime transport, and to obtain from the allies, primarily the Americans, the ships which France did not possess, Senator Henry Béranger, Member of the Senatorial Commission of the Army, recommended as early as the spring of 1917 the creation of an inter-allied oil conference. Although this proposal did not receive immediate attention, it had the merit of initiating significant French diplomatic activity, particularly in London. The negotiations were intense, heated, and led to the establishment of the new system of oil production, distribution, and sales, represented by the famous C.F.P.

The Shift from a Closed to an Open System

One cannot fully grasp the stakes involved in the oil economy without a systemic vision to avoid the intellectual danger of a simple "listing of factors." We must study the determinants of the companies' performance, and consequently of the French oil economy in general, within system theory. According to Ludwig von Bertalanffy, a system is a set of elements (at least two) in interaction.[33] For example, **A** has an affect on **B** and **B** on **A**; two systems can in turn interact with each other (see Figure 6).

This diagram is useful in demonstrating that the proper functioning of a system can condition the operation of a related system. Systems linked to each other are inevitably open systems, as opposed to closed systems. The objective of this analysis is not to study the interactions among elements but to analyze the behavior of the system as a whole. A system is different from a set. While a set is simply a single collection of elements with particular characteristics, we cannot reduce the properties of a system to the properties of its components. A man and a woman can form a set but a couple forms a system; properties can emerge from the

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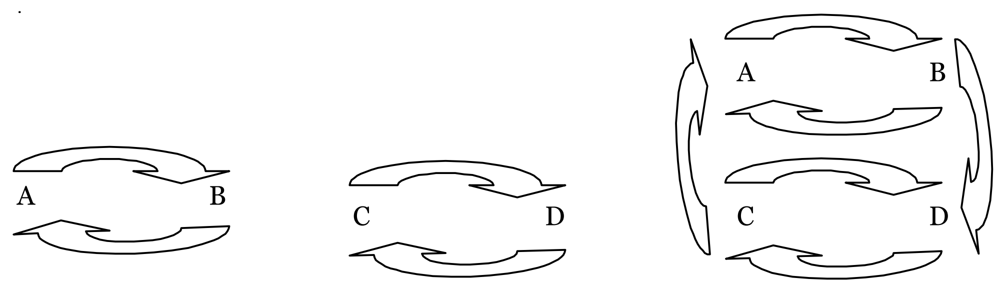
published by Francis Delaisi in annexe to his book: *Le Pétrole*, Payot et Cie (Paris, 1921), 143-144.

[32] André Bihel, *Le problèmes économiques du pétrole et l'Etat,* a doctorate thesis in Law Paris: Les presses modernes, 1938.

[33] Ludwig von Bertalanffy, "General System Theory, A New Approach to Unity of Science," *Human Biology* 23 (1951). Another definition in accordance with that of Bertalanffy, more precise, that of Joël de Rosnay: A system is a whole of discrete elements (component, constituent) inter-connected or in dynamic interaction, organized according to a determined purpose. See "Education, écologie et approche systémique." AGIEM Colloquium, 1994.

interrelationships created. New laws or regulations produce changes on the legal or the political level that influence economic activity. Reciprocally, changes in economic data, through the intervention of new oil sources for example, directly influence regulations, in particular, and the system of market functioning, in general.

FIGURE 6



System I System II System III

Changes in Economic and Geopolitical Context. The First World War ended with a complete transformation far beyond the boundaries of the nations that struggled for 4 long and bloody years on the European continent. Changes in economic factors were of a breadth and significance hitherto unknown. However, political changes, the redrawing of the map, were equally dramatic. Germany was defeated and returned Alsace-Lorraine to France; Austria-Hungary and the Ottoman Empire collapsed in 1918 and exploded into fragments. Pursuant to the principle of nationalities, these remains gave rise to a multiplicity of States.[34] Russia, in full Bolshevik revolution was, for some time, outside the concert of the great powers but the very presence of the Soviet Union had a powerful influence on international politics. National criteria were used to draw the boundaries of the new States of Central Europe, regardless of their economic viability. France and the United Kingdom were victorious, but because of the entry of the United States into the war in April 1917, and its decisive role in the Allied victory, they gave up world preeminence. Links between colonies and their European motherlands were stretched if not broken, and significant movements for national independence launched. To finance the war, the Allied States subscribed to loans from the United States, and were thus heavily in debt at the end of the war. The rapid increase in the money supply resulted in depreciation of the European

[34] Jacques Benoist-Méchin, Le Loup et le Léopard: Mustapha Kemal ou la Mort d'un Empire (Paris, 1954).

currencies and a high rate of inflation. The United States grew ever more wealthy. The Americans benefited from the decline of Europe and seemed to be the biggest beneficiaries of the war; the dollar became the international currency. Economic diplomacy failed to establish the basis for true international cooperation capable of addressing the global crisis.[35] Beyond these geopolitical consequences, the war gave rise to the "diplomacy of oil," and oil, a "sensitive product" if there ever was one, became the subject of the new economic diplomacy. The ever-increasing reliance on motorized transport developed in a context in which the conditions for the establishment of an autonomous French oil industry became propitious.

The context of the First World War obliged military authorities to be very receptive to the rapid innovations in the aviation sector. The rapid expansion of commercial aviation as soon as the war ended, the development of automotive transport, both commercial and tourist, the mass production of diesel engines, all these factors and others contributed to the intensive increase in the world consumption of petroleum products. The driving force behind this increase in consumption remained the automotive industry. Everywhere automobile manufacturing reached unprecedented quantity and quality levels at increasingly lower prices, thanks to new technology. Between 1919 and 1923 American production increased by 110 percent and the sales turnover by 44 percent.[36] With what is sometimes termed the second, or even the third industrial revolution, based on the internal combustion engine, the world entered the era of "popular" motoring, an era of oil consumption on a large scale. The demand accelerated so rapidly that the belief was that no one should miss any opportunity to invest to the maximum possible in oil extraction.

With the outbreak of the First World War, 40,000 German shares, accounting for 25 percent of Deutsche Bank's holdings in the Turkish Petroleum Company (T.P.C.) were sequestered in London; these were allotted to France after the peace treaty under the terms of the Treaty of San Remo of 1920.[37] What would France make of its new oil rights? The Anglo-Persian Oil Company (A.P.O.C.) became the biggest shareholder in the T.P.C.[38] However, its representatives insisted that the French share should be reserved for a private company rather than come under public control. President Raymond Poincaré contacted Ernest Mercier, President

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[35] Guy Carron de la Carrière, *La diplomatie économique, le diplomate et le marché* (Paris, 1998), 33-44.

[36] Jean P. Bardou, Jean J. Chanaron, Patrick Fridenson, James M. Laux, *La révolution automobile* (Paris, 1977), 127.

[37] Turkish Petroleum Company (T.P.C.) created in 1911 became Iraq Petroleum Company (I.P.C.) on 8 June 1929.

[38] Anglo-Persian Oil Company (A.P.O.C.) created in 1909 became Anglo Iranian Oil Company (A.I.O.C.) in 1935 and British Petroleum Company (B.P.C.) in December 1954.

of a major electrical power company (Union de l'Electricité), and entrusted him with mission of establishing the C.F.P.[39] The procedure would be to associate the C.F.P. with any pre-existing oil company which was legally French. Founded on March 24, 1924, with a capital of 25 million francs and Mercier as its first president, the C.F.P. had good representation from French companies, in particular Desmarais Frères, whose General manager Robert Cayrol served as administrator.[40] However, the question of the new French interests in the Middle-East was not completely resolved. Indeed, the T.P.C. derived its rights primarily from a letter of the Grand Vizier of June 28, 1914, addressed to the ambassadors of England and Germany, promising to concede to the T.P.C. any oil reservoirs discovered in the *vilayets* (districts) of Baghdad and Mosul.[41] In 1920, the fate of the Ottoman Empire was not yet determined. The principle of governing through mandates was agreed upon for certain territories, in particular those detached from the Empire and already agitated by the eruption of local nationalist movements. This produced many disorders in Turkey and Iraq.[42] In 1921, the British Government named King Fayçal, driven out of Syria, as the nominal ruler of Iraq. Iraq, however, technically remained under the sovereignty of Turkey, until the Treaty of Lausanne of July 1923 recognized Iraqi independence).[43] It was only after the border disputes between Turkey and Iraq were resolved in 1926 that political questions could be resolved, enabling the beginning of the exploitation of what was (correctly) believed to be vast oil reserves in Mesopotamia. It was then that French participation in the T. P. C. became a question of urgency and topicality.

Discussions lead to the creation of the Irak Petroleum Company (I.P.C.) in 1928 and to a redistribution of capital (see Table 1).[44]

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[39] Former engineer specializing in Marine engineering, Ernest Mercier began in the oil industry in 1921, when he became president of the Omnium International des Pétroles. In 1922, O.I.P., with the Anglo-Persian group, took control of Steaua Romana, the most significant oil company of Romania. In the same year, it created Steaua Française, of which he became the president. Compare Richard F. Kuisel, *Ernest Mercier, French Technocrat* (Berkeley, Calif., 1967).

[40] He was called, on several occasions, to defend the oil interests of France in the Middle East. See Maurice Guierre, *Robert Cayrol 1883-1959: De la mer au pétrole, l'unité d'une vie* (Paris, 1960), 37-46.

[41] Jean Rondot, La compagnie Française des Pétroles: du Franc-or au Pétrole-Franc (Paris, 1962).

[42] **http://www.pbs.org/wgbh/commandingheights/lo/countries/iq/iq_overview.html.**

[43] Hervé Coutau-Bégarie, *Géostratégie de l'océan indien* (Paris, 1993), 160.

[44] To reconsider the question of the negotiation of the French interests to the Middle East leading to the creation of the C.F.P., See: André Nouschi, "L'Etat français et les pétroliers anglo-saxons: La naissance de la Compagnie Française des Pétroles (1923-1924)," in *Relations internationales*, n° 7, 1976, pp. 241-259.

TABLE 1
Distribution of capital in I.P.C.

Company	Percent share
British Petroleum	23.75
Royal Dutch-Shell	23.75
Compagnie Française des Pétroles	23.75
Near East Development Cy	23.75
- Standard Oil of New Jersey (50%)	
- Socony Mobil Oil (50%)	
Partex Gulbenkian	5.00

At this key moment, the companies that created the I.P.C. signed the famous "Red Line" agreement on July 31, 1928. The perimeter circumscribed corresponded roughly to the borders of the old Ottoman Empire; Saudi Arabia was included as well as Iraq, Syria, Palestine, and Transjordan. The understanding was that the oil produced in Iraq would be shared. The agreement also included restrictive clauses that obliged all of the participants to respect "oil solidarity" within the boundaries of this perimeter.[45] If a company prospected oil and obtained concessions within the perimeter bounded by the Red Line it was committed to include each of the five partners so that production would be shared proportionally according to the basic agreements, and not to exploit the new oil fields alone. This comfortable arrangement would function with very little friction up until 1946, when the two American partners (Standard Oil and Socony) declared that the restrictive clauses were against the legislation and American policy.[46]

The Dominant Position of the C.F.P. among Its Partners in the I.P.C. From its creation, the C.F.P. endeavored to develop an oil program under French control in the various producing areas. It organized exploitation of the oil reserves to maximize the advantage of the French state, through diplomatic or other types of agreements, whether closed or open-ended.[47] The essential objective was, through the utilization of juridical or structural means, to encourage oil-refining activity on French soil. However, in 1925, the richness of the oil deposits lying under the Mesopotamian desert remained hypothetical, indeed unconfirmed by the first geological mission of the T.P.C. in 1926 in Iraq, which resulted in dry wells and highly sulfurous drillings. Only in 1927, in Baba-Gurgur to the

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[45] Archives of the Centre de Documentation et de Synthèse (CDS) in Total, 89.16/42.
[46] Ibid.
[47] Frédéric M. Bergounioux, *La France et le problème du pétrole* (Toulouse, 1941), 119.

north of Kirkuk, was a significant quality of oil discovered.[48] This discovery drew the attention of both French politicians and foreign partners of the I.P.C. to the importance of the stake of the C.F.P. in the concessions in Irqu, and hence to French oil interests in general. The French realized that it was imperative to focus on developing this highly promising new field, which represented an as-yet-unregulated strategic market. The foreign partners quickly became aware that they might not only lose one of their best customers, but that the French might become competitors on the world market, and quickly developed mixed feelings about the C.F.P.

The Strategy of the C.F.P.: Integration at the Internal Level and Penetration into the World Arena. The C.F.P. strategy involved two principal imperatives: one internal and the other external. On the internal level, the goal was to set up, through legislation, a business environment that would encourage French refining, to convince the State to intervene in an intensive way. On the external level, the goal was to negotiate the best possible arrangements with the First World War allies.

For all the French oil firms, the change in the political environment and the entry of Mesopotamian oil were environmental factors of major importance. In a sense these two factors were truly liberating, a source of vital energy for every French company that wished to profit from the oil trade. The State's consideration of this internal dynamic, and of these new opportunities, radically transformed French oil policy, leading to a structural transformation of the French oil industry.

Special permits, known as A3 and A10, constituted one of the instruments of French policy in applying the law of March 30, 1928.[49] This fundamental law, passed following long parliamentary debates, defined the framework in which the French oil industry would operate. In fact, it gave the State a monopoly with respect to the importation and refining of oil. The State gave companies special holding permits valid for 10 years for crude oil (A10), and 3 years for refined products (A3). Thanks to these permits, the processing capacity of the French refineries, less than 300,000 tons a year in 1927, reached eight million tons in 1938. Parallel to this impressive increase in distillation capacity, was a less obvious (but almost as significant) increase in refineries' ability to manufacture products, and improve the quality of those products. Companies could now use imported crude to manufacture on French soil many products imported before the war (first butane and propane, then practically all the variety of gasoline products, special products and lubricants). By 1938,

[48] *Pétrole Informations* n° 1309, 29 Mar./4 April 1974.

[49] In French, *Autorisations Spéciales d'importation*. See the Archives of Desmarais Frères: 130 AQ 1, 130 AQ 2 and 130 AQ 3.

the percentage of French imports of refined products dropped from 94 percent of the total petroleum imported in 1929 to 18 percent.[50]

Beginning in 1928, public authorities intervened in oil transport using oil tankers. Decrees provided special authorization for imports requiring that a percentage of the petroleum be carried in French ships, authorized by the relevant ministries. The Comité des Navires Citernes, which operated under the auspices of the Ministry of Industry and Commerce and the Ministry of Merchant Marine, guaranteed oversight of the application of these decrees. The aim was to create as rapidly as possible a fleet that could transport all the petroleum products necessary to the provisioning of all France without spending foreign currencies. This did not mean using only French ships to supply the franc zone; it was preferable that foreign ships do part of this provisioning, and the corresponding expenditures be recovered by leasing French ships to foreign companies. Thus, the French national fleet would not monopolize all the transport of oil to French refineries, and a certain level of foreign competition would remain. This would provide a useful stimulus to the French freight market.

A convention between the State and the C.F.P. in 1924 followed by another in 1930 and ratified by the Parliament in 1931, gave the State the capacity to exert general supervision over the oil industry. In particular, the right to veto Council decisions, reserved for the two government commissioners, was equivalent to requiring a semi-official permit for significant cases before submitting a project to the administrators. The State's role as principal shareholder of the C.F.P. since 1932 had given a new justification to its "right of glance".[51] Support for this policy came from the Office National des Combustibles Liquides (O.N.C.L.) and the Compagnie Française du Raffinage (C.F.R.). A January 10, 1925 law created the O.N.C.L.[52] Its role was not only the study of all questions relating to oil, but also, thanks to its significant budget, to allot allowances to tankers working on French soil and to finance the search for oil in both France and the colonies.[53]

April 30, 1929 represents a major event in the history of oil in France: the C.F.R. was created with 100 million francs capital in Paris, in front of Maître Lanquert, lawyer. Its aim was "the industry and trade of all solid, liquid and gas fuels, of hydrocarbons in general and all their

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[50] *Le coût en Divises de l'Approvisionnement Pétrolier Français,* Report of the Conseil Supérieur du Pétrole (Ministère de L'Industrie et du Commerce), December 1955.
[51] Emmanuel Catta, Victor de Metz: de la C.F.P. au groupe Total (Paris, 1990), 243.
[52] Loi du 25 janvier 1925. Annales O.N.C.L. 1926, p 152.
[53] Cf.: Laurent Ursulet, *L'Office National des Combustibles Liquides (1925-1939),* a Mémoire de Maîtrise under the direction of Professor Dominique Barjot, University of Paris-Sorbonne (Paris IV), 1999. pp. 63-66.

derivatives."[54] As expected, the authorization to refine was granted to the holder of the refinery, rather than to the distribution firms, which were expected to show solidarity to the refinery. The C.F.R. was, in this respect, a very particular case. It had two quite distinct branches: first, treating the crude oil of the C.F.P. and delivering, uniformly, to all the distributors, 25 percent of their marketable products; second, engagements with other distributors, in particular Desmarais Frères, the largest private shareholder of the C.F.R. (18.6 percent). To understand the history of refining in France, it is necessary to include arrangements between the large new refining company (C.F.R.) and the various national distributors. Two refineries were constructed, the first in Normandy in Gonfreville, near Le Havre (inaugurated in 1933, its capacity was 900 000 tons of crude oil), the second on the pond of Berre, in Provence (started production in 1935).[55]

Indeed, the importers (called members) undertook to buy from the C.F.R. all (apart from the 20 percent reserved for importation) the fixed-quota oil products they could. In addition, under the terms of a convention on March 19, 1929 between the State and the C.F.R., the holders of permits of importation should be compelled to supply themselves at the C.F.R. in oil fixed quotas products, to the amount of 25 percent of their releases to the market. Under these conditions, on August 1, 1929 the C.F.R. and its various members signed an agreement based on the convention of March 19, 1929 between the State and the C.F.P. According to this convention, the member companies pledged to buy from the C.F.R. each year the quantity of oil corresponding to their share of distribution on the market, while the C.F.R. would be able to make the delivery of the totality of the refined products. Fuel oils, road-oils, asphalt, pitches, and petroleum cokes were not included in the convention. Desmarais Frères, however, would have priority in obtaining these products from the C.F.R., at equal prices under equal conditions. The products targeted by the article were oil gasoline of various qualities, refined mineral oils, gasoline, different kinds and qualities of fuels, compressed butane, propane and gases, and so forth.[56]

For the majority of the other refineries, the bonds linking the refinery with the distributors through which they made their statement of solidarity were not simple commercial contracts, but, rather, based on financial interests that identified the group. Desmarais Frères signed a franchise agreement with the C.F.R. within the framework of the contracts of national interest (Contrats d'intérêt national) without giving up its

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[54] Archives of Total 89.14/18.

[55] Cf. "La Compagnie Française des Pétroles et la Compagnie Française de Raffinage, origine et historique des deux compagnies" Archives of Total, 89.14/18.

[56] Archives of Desmarais Frères: 130 AQ 1.

commercial independence.[57] The development of the C.F.R. affected Desmarais Frères, which yielded part of its refining rights to have broader distribution rights. The objective of this vision was to reduce petroleum product production costs.

This vision grew out of using 1929 market releases to compare the benefits of two cases: when the C.F.R. refined exclusively for the distributors and when the distributors refined for their account (see Table 2).

As the table shows, the industrial benefit (by ton of refined crude) was weaker in the second case (5.7 percent), because the refineries had less capacity, but the operations had more or less the same industrial profitability. Customs protection was of greater significance for the distributors when they refine for their own account (15.4 percent), because the C.F.R. absorbed part of the customs protection of the tonnage yielded to the distributors. In Industrial economy, this represents a shift from a traditional economic analysis to a transaction cost economic analysis. Intermingling the views of John R. Commons, who makes the transaction the fundamental unit of economic analysis, with those of Alfred D. Chandler, Jr. who stresses the importance of industrial innovations, Oliver E. Williamson emphasizes the fact of existence of intermediary forms.[58] This analysis of contracts is similar to those between the C.F.R. and its partners and in Williamson's own terms constructs a general theory of choosing "institutional arrangements" or "governance structures." On this basis, we could make a connection between the nature of transactions and institutional forms, conceived as contract systems, according to a principle of reducing transaction costs.[59] Thus the State supported the development of only one large refining company and succeeded in integrating it with the upstream by adding the capital of the largest distribution companies, and their downstream as far as marketing by encouraging the development of their distribution activity.

The agreement between the C.F.P. and the State was not without difficulty, but it had the merit of defending the French interests on the international level.[60] This agreement was all the more useful when there were tax questions in favor of the long-term future of the Company. From 1924 onwards, the C.F.P. managed the French share (23.75 percent) within the I.P.C. However, the risks in exploration and production activities abroad were very high. The advantage of economies of scale, from which

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[57] Ibid.

[58] John R. Commons, *Institution: Its place in Political Economy* (Madison, Wisc., 1934); Alfred D. Chandler, Jr. "Organizational Capabilities and the Economic History of the Industrial Enterprise," *Journal of Economic Perspectives* 6 (Summer 1992): 79-100.

[59] Oliver E. Williamson, "The Logic of Economic Organization" in *Journal of Law, Economics and Organisation* 4 (1988): 65-117.

[60] Emmanuel Catta, *Victor de Metz: de la CFP au groupe Total*, 242-264.

the American and British companies benefited, put competition on a higher level. The March 1928 law supporting French refining reflected the awakening of the real danger of competition.

TABLE 2
Comparison between the Benefits to the Distributors in Two Different Cases (in francs)

	C.F.R. to Distributors Exclusively	Distributors Refine
Initial capital	567,000,000	234,000,000
Stocks/working capital	441,000,000	221,000,000
Total invested	1,008,000,000[a]	455,000,000
Profit Industrial		
Normandie	1,245,000 t, x 40 frs = 49,800,000	700,000 t, x 35 frs = 24,500,000
Provence	684,000 t, x 24 frs = 16,400,000	271,000 t, x 15 frs = 4,100,000
Total	68,200,000 (6%) 35%* = 23,170,000	28,600,000 (5.7%)
Customs protection		
Normandie	1,245,000 t, x 72.5 frs = 90,262,500	700,000 t, x 72.5 frs = 50,750,000
Provence	684,000 t, x 60 frs = 41,040,000	271,000 t, x 60 frs = 16,100,000
Total	131,300,000 (11.8%) 35%* = 45,955,000	67,000,000 (15.4%)

Source: Archives of Desmarais Frères 130 AQ 1.
*35% = 352,800,000; the part corresponding to the participation of the State in the capital of the company.

The processing capacity of the French factories, below 300,000 tons per year in 1927, reached 8 million tons in 1938. Parallel to this impressive progression of refining capacity, was the less striking, but almost as significant progress that occurred in the quantity and quality of goods that the refineries were able to manufacture. Beginning with butane and propane before the war, practically all varieties of gasoline, special products, and lubricants could be manufactured on French soil from the imported crude. Overall, the share of the products refined from French imports of petroleum products passed, in tonnage, from 94 percent in 1929 to 18 percent in 1938.[61]

Thanks to the State policy of industrial integration, in 1936 the C.F.P. for the first time registered a benefit higher than 10 percent of the capital and paid a dividend of 5 percent. The French State waited until 1937 to reach super-profits of 5 million francs, which increased to 7 million in 1938, to which were added the 35 percent dividends of the company's capital (54 million).[62] On the eve of the Second World War, all C.F.P. activities were in full development. Crude products made up 80 percent of the imports and France exported an increasing quantity of refined products (600,000 tons in 1937, of which half were with its empire).[63] Moreover, the C.F.R.'s activities were measured by the increase in tonnages of the crude oil treated by its two refineries in 1939: in Normandy, 1,370,000 tons and in Provence, 600 000 tons of crude.

Conclusion

Although spectacular, the State's strategy for rapid development of the C.F.P. with the participation of the vibrant force of French companies, occurred only because of the constraint of defense vis-a-vis the Anglo-Saxon companies. It was a shining example of how, under certain circumstances, installation of an international structure becomes a peremptory necessity. One clearly sees the French capacity for adaptation in the evolution of its oil industry from a closed system to an open and dynamic one. The case of the C.F.P. can be studied through Bertalanffy's system theory, which shows the insufficiency of the traditional diagram of reductionism and of general mechanist assumptions, to explain the numerous and complex interactions characterizing the modern techno-polis that influence technological and social organization. However, the development of the C.F.P. corresponds almost perfectly with evolutionary theory because it offers an exemplary case of path dependency.[64] Indeed, the adaptation of the French companies, actors on the French market, to the constraints met is a source of variations. If evolution is based on the

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[61] Report of the « Conseil Supérieur du Pétrole » (Higher Council of Oil), Ministère de L'Industrie et du Commerce, "Le coût en Divises de l'Approvisionnement Pétrolier Français," December 1955.

[62] *Pétrole Informations* n° 1309, 29 Mar./4 April 1974, "La C.F.P. a cinquante ans"), 11.

[63] Alain Beltran, Sophie Chauveau, *Elf Aquitaine: Des origines à 1989* (Paris, 1998), 18.

[64] Richard R. Nelson and Sidney G. Winter, An Evolutionary Theory of Economic Change (Cambridge, Mass., 1982); Laurent Tissot and Béatrice Veyrassat, eds., *Trajectoires technologiques, marchés, institutions. Les pays industrialisés. 19ème et 20ème siècle: De la dépendance du contexte à la dépendance de sentier* (Bern, 2001).

adaptation of the agents and processes by which the system always produces innovations and these "have always the capacity to try out and discover new rules and thus continue to introduce behavioral innovations into the system," the evolution of the whole system created by the State is not random, but follows a "path" determined by accumulated abilities and training, enabling it to evolve in a changing environment.[65] What remains remarkable in the case of the development of the C.F.P. is the discovery of optimal convergent behaviors as a direct consequence of public policies. Evolutionary theory shows how the company learns and ends up with these kinds of behaviors, although they are often temporary, suboptimal, adaptive, and related to perceptions of the constraints of the national or international environment.

In addition, as oil is strategic, vital for economies, and an object of world covetousness, the entry of the C.F.P. on the international scene at the same time as the entry of the American companies in the Middle East at the end of the First World War, can do much to inform us about globalization today. It began at the end of the First World War when the glory of the allies correlated perfectly with the glory of their respective national oil companies. Moreover, if France signed its entry into the club of the oil giants during the interwar period, the United States affirmed its entry in an economic war within Europe.[66] It would succeed in safeguarding its primacy thanks to the financial and tariff policy of its government on the one hand (for example, the Webb Act of 1918, exempting exports from the anti-trust acts) and with the economy of scale strategies of its multinational companies on the other. Retrospectively, if a unified Europe today does not affirm its independence vis-à-vis the United States, it is specifically because of the United States assistance to France during the First World War. Very curiously, this war emerged to support and consolidate the concentration of capital, an element very favorable for the oil industry.

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[65] Giovanni Dosi, Richard R. Nelsen, "An Introduction to Evolutionary Theories in Economics," *Journal of Evolutionary Economics* 4 (September 1994): 157.
[66] Georges-Henri Soutou, "Les buts de la guerre économique des Etats-Unis," **www.stratisc.org**, published by ISC-IHCC-CHAE, 1999.