French Oil Protectionism
And the International Political Economy of Rent Seeking
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Abstract
Quantitative protectionism, more precisely import substituting industrialization through quantitative trade restrictions, has been one of the most popular development policies of the 20th century. The researches led around Anne Krueger, based on scarce data from Third World countries, concluded on its overall inefficiency, caused by rising macrroeconomic costs and rent capture. One of the most ambitious implementations of import substitution, French oil protectionism created detailed archival data which allow to quantify its costs and gains for more than half of the 20th century. Contrary to Krueger's findings in Third World countries, we show that the yearly macrroeconomic cost of the policy, an average of 3% of GDP, remained under control and gradually decreased from the 1960s. Detailed biases of quota allocations show that rent seeking linked to big companies and dominant geographical places remained limited. We show how the shifts in trade protection linked to the weight of social-administrative groups in quota juries brought the biggest imbalances to the system. After the discovery of oil in Algeria, social-administrative rent seeking increased the political instability of the Fourth Republic and peaked as soon as the end of the 1950s. Hence, in the case of French oil, quantitative protectionism was macrroeconomically efficient in the long run, but created medium term political instability.

Keywords: Trade Protectionism, Import Substitution, Quantitative Restrictions, Oil, Rent capture, Rent seeking
JEL: F13, N14, O14, O24, Q48

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“Great red gods, great yellow gods, great green gods, planted at the edges of the speculative tracks along which the mind speeds… Scarcely ever before has man had the pleasure of seeing destiny and force look so barbaric… These modern idols share a parentage that makes them doubly redoubtable. Painted brightly with English or invented names, with one long and supple arm, a luminous, faceless head, a single foot, and a belly stamped with numbers – the gas pumps sometimes take on the appearances of Egyptian gods, or those of cannibal tribes who worship nothing but war. O Texaco Motor Oil, Esso, Shell! Great inscriptions of human potentiality! Soon shall we cross ourselves before your fountains, and the youngest among us will perish for having contemplated their nymphs in naptha.”

Aragon, Paris Peasant, 1926.

I - INTRODUCTION

Since 1945, the progressive decrease in customs duties in the world has been accompanied by a parallel development of quantitative restrictions of trade and financial flows. Quantitative restrictions of trade have been enacted through licences or quotas. Quantitative restrictions of financial flows took the form of bilateral or multilateral clearing accounts, or of foreign exchange control. One of the main aims of those policies was to protect domestic markets in order to substitute national production to foreign imports. Concerning a broad number of emerging countries, Anne Krueger and Jagdish Bhagwati’s researches attracted in the 1960s and 1970s the attention of the public and of the international organizations on the drawbacks of such policies (Bhagwati 1978). The OECD asserted that the objective of industrialization through import substitution was quickly encountering the limits linked to rent capture.

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1 This working paper is based on extended researches from my PhD thesis, which presented a first analysis of French quantitative trade and capital flows restrictions (Brault, J. (2013a). The International Transactions of France from the 1920s to the 1970s, unpublished PhD thesis, Graduate Institute of International and Development Studies, Geneva). I also researched French foreign exchange control (Brault, J. (2013c). "The Political Economy of French Foreign Exchange Control"). My works are available on [www.julienbrault.net](http://www.julienbrault.net). I would like to thank Marc Flandreau, Gopalan Balachandran and Dominique Barjot for their continuous support and guidance. Comments from Alain Beltran, André de Lattre, Olivier Feiertag and Giacomo Luciani also helped in improving this paper substantially. I would also like to thank the participants of the the Historical Mission of the Bank of France Seminar, the International History and Politics Seminar of the Graduate Institute of International and Development Studies of Geneva, the International Finance Chair Seminar of SciencesPo, the Roads of Oil Total Conference, the Diplomacy and Natural Resources Colloquium, and the European Conference on African Studies. Archival and data help from the French Oil Professional Comitee (CPDP), the French Oil Institute (IFP), Total S.A, INSEE, the Bank of France, the London Petroleum Institute, and Worldscale, is gratefully acknowledged.
"The experience of France shows how, when one is engaged in this path, it is hard and long to modify the structures and to transform the state of mind of the producers. Hence, it appears indeed that the policy consisting in substituting national production to imports – unavoidable and legitimate in itself – is meeting, after fifteen or twenty years, rising difficulties, and constitutes an obstacle to economic growth" (OECD 1973).

The high point of this dismissal movement was the World Bank report of 1987, which rejected quantitative restrictions as a long term development policy (World Bank 1987). This in turn fitted into a broader movement of liberalization, which led to the Washington consensus of 1989. Many quotas were nonetheless maintained, notably in developed countries, in agriculture and textile, throughout the 1980s. Import quotas, notably in North America, for sugar, milk products, textile, automobile and metal products, certain dating back to the 1930s, were then the subjects of many studies (see notably Feenstra 1989 and Anderson 2003). These macroeconomic studies, comparing many general indicators in a great number of countries, have been criticized, and researchers have been increasingly calling for studies of precise episodes of restrictions (Edwards 1993).

French oil protectionism was one of the best examples of quantitative trade restrictions. Representing approximately one tenth of national imports and State income in the long run since the interwar, French oil nurtured a rent seeking process in the public office. These processes gravitated around the "Corps", official administrative bodies composed of alumni of major universities, the "Grandes Ecoles". A particular social-administrative group of mining engineers has been particularly accused by the historiography of capturing oil profits thanks to its control of a rentier State (Yates 2010). This central role of oil as well as the access to continuous and trustful statistical sources invite us to study French oil products import restrictions. Created during the First World War under the form of licenses, formalized by a law into quotas in 1928, replaced by automated mechanisms after 1980, and abolished in 1992, they lasted 52 years with formalized restrictive quotas, 64 years if the automated period is included, and 78 years including the licensing period.
Actors of this policy have, at the time, cast a positive look at its efficiency. Louis Pineau, head of the organization in charge of oil quotas, asserted for instance in 1934: “This law (instituting the quotas), now evaluated and imitated by numerous countries such as Japan, Italy and Germany (sic), proved to be a flexible instrument required by still a complex task. I think flexibility is a key to its value and merit”\(^1\). Have oil products import quotas in France been full of “value and merit”, or an “obstacle to economic growth”? The following section presents our summarized findings (II). We then go on by presenting the theoretical questions regarding quantitative restrictions (III) and a historiography of French oil (IV). The fifth section presents the data and explains our choices of indicators (V). We then present the results of our empirical study (VI), before a conclusion (VII).

**II - MAIN FINDINGS**

This study seeks to assess the efficiency of one of the main protectionist policies of the world in terms of volume in the 20th century. Previous researches on quantitative trade restrictions relied on scarce statistical evidence, often an extrapolated ratio of authorized quota for one sector, one country and one year. We detail the rich available data for the case of French oil, as well as its limits. Notably, we couldn't find at this stage a decomposition of French oil imports from Algeria per company, and detailed life curricula of the members of the administration boards of French oil companies. Nonetheless, our study allows to build relatively continuous and elaborate indicators in the long run. Detailed ratios of quota authorizations could be computed per companies, geographical spaces and social-administrative groups. Over the core,

\(^1\) Catta and Lemasson, "Approval of the law of 1928", archives of Total S.A.
formalized and restrictive quota period of 1928-1980, excluding the war, the industrialization rent, i.e. the macroeconomic cost of the policy, could be computed for 56 % of the years, and rent capture for 95 %.

A new narrative of French oil history and an assessment of the efficiency of import substitution are built out of the archives and data of the oil protectionist system. We build indicators of returns, concentration, production capacities, equity, and an oil trade protection rate combining customs fees, quotas and taxes. Its rise in the 1930s confirms the increase of French protectionism. The efficiency of the policy appears mitigated during the decade, failing notably to create big industrial groups. On the contrary, the success of the policy in terms of industrial strategy, concentration and production, is apparent in the 1950s, but seems to be facing problems from the end of the decade. More than the quota system, it is Algerian oil at the end of the 1950s which allowed the industrial returns of the sector to gear up. A difficult but effective geopolitical success in terms of supply, French oil protectionism appears to have had excessively prolonged costs from the 1960s.

The average yearly oil industrialization rent as the macroeconomic cost of the protectionist policy, which we compute at 3 % of GDP, has been a massive phenomenon from the point of view of the French oil sector in the 1950s and the first half of the 1960s. It remained nonetheless under control, balancing big costs with big gains considering the utmost importance of oil energy in afterwar growth. Its main long term success has been the emergence of two, then one French major, Total S.A. Moreover, after an initial increase, this rent tended to diminish after 1959 until the oil shocks.

The yearly averages of rent capture by big companies and Paris were computed based on biases in quota allocations. Representing respective yearly averages of 5 and 6 % of the industrialization rent, they remained limited. Since we lack data on the curricula of the members of administration boards of oil companies, we design a rawer indicator of social-administrative rent capture. We witness a link between
the weights of the two dominant social-administrative groups in quota juries, the "X-Mines" oil engineers and the "SciencesPo-ENA" civil servants, and the trade protection rate. We then compute the virtual shift in imports if the presence rates of the two groups in the juries would have been interverted, and if the trade protection rate would have been completely correlated with their respective weights. This gives a much higher yearly average of 66 % of the industrialization rent. Like the trade protection rate and industrialization rent, all rent captures follow from the 1920s to the 1960s an inverted U-curve leading to the end of the policy.

Our case study brings forth new empirical elements to understand lasting forms of protectionism in today's more advanced emerging countries. For countries and sectors at intermediate stages of development and with mature administrations, the case of French oil shows that quantitative protectionism is economically efficient in the long run, but creates medium term political instability caused by shifting stands of social-administrative groups on protection.

III - THE ECONOMICS OF QUANTITATIVE PROTECTIONISM

It is quite hard to summarize what we know and don't know about quantitative protectionism in a few pages. We nonetheless present in a summarized way the main questions revolving around this crucial economic issue in order for the reader to seize the stakes of our study. We interest ourselves in the main form of protectionism enacted during the 20th century, that is, industrialization by import substitution through quantitative restrictions of trade flows, by distinction from protectionisms using only customs duties. This is an economic development policy trying to stimulate domestic production of formerly imported goods. Its principle consists in planning and governmental controls trying to allocate rare
imported resources to industries in need of it. Quantitative limitations of imports must be coupled with an increase in investments, production and profits on national soil (Bruton 1998).

The theory of quantitative protectionism has thrived around three main currents. Its first theoretical orientation was the theory of the protection of infant industries, notably developed by Mill and Bastable in the 19th century. Its central argument was the legitimacy to commercially protect a nascent industry suffering from a backwardness compared to another country (Kemp 1960). A second current tried to explain the backwardness of Central European development during the interwar (Rosenstein-Rodan 1963). The theory was then developed for Latin America by Raúl Prebisch, who directed the United Nations Commission for the region (United Nations 1950). A third orientation, linked to the two others, finally dealt with the relation between this policy and external agents, development funds or trade partners, which often posed import-substitution as a condition to their help (Bhagwati 1978).

A main stream of economic development theories, quantitative protectionism also thrived in reality during most of the 20th century. Import substitution was enacted for sectors with difficulties or backwardness, or as a general policy during crisis or catch-up periods. This was the case in the major part of Europe and Latin America after 1929, and in the US, notably for sugar from 1934, milk products from 1937, and oil from 1959. After the war, the persistence of American protectionism incited the American business world and executive power to think that this policy was the only way for many countries to industrialize themselves, and the only way for American investments in those countries to be profitable (Maxfield 1990). Import controls were enacted in numerous Third World countries, notably Brazil until 1953, Argentina until 1958, Pakistan until the beginning of the 1960s, and India until 1966 (Little, Scitovsky et al. 1971).
The advantages and drawbacks of quantitative protectionism have been extensively studied. The literature stated the advantages of quotas in order to cut import peaks and fight world cartels. Quotas allowed legislators the escape costly GATT negotiations and national parliamentary processes on customs duties (Edwards 1993). They would allow for more informed discrimination in licenses attribution (Krishna 1993). Conversely, quotas have been criticized because of the discretionary choices they imply, the fact that they may be avoided thanks to product substitutability, and far more complex trade negotiation procedures.

The classical analysis of protectionism dwelled on indicators of returns, which were forecast to grow in the long run. It also analysed the growth of the savings of the considered industry, which would allow a rise in investments, as well as the growth of the production capacity. All this was then related to a trade protection rate in order to assess its efficiency. For Columbia and Nigeria, Diaz-Alejandro and Oyejide find positive links between the trade protection rate and the industry growth rate. However, this link is negative in the Chilean case analysed by Jere Behrman. If quotas are allocated depending on the capacities of the companies, this can lead to voluntary overcapacity, as in the case of Pakistan in the 1950s and 60s, studied by Winston, of Ghana studied by Leith, and of Turkey and India. This is not always the case, as Behrman shows in the case of Chile.

The analysis of quantitative protectionism has been rooted from the 1970s in the rent-seeking movement, initiated by Anne Krueger and Jagdish Bhagwati (see notably Bhagwati, Desai et al. 1970, Bhagwati and Krueger 1973, and Krueger 1985). Quantitative restrictions started to be explained by a low-level of capital mobility and successive devaluations in the after-war, which would have caused a rise in foreign imports linked to loans coming from developed countries, first among them the United States. Krueger and Bagwhati suggested ways to calculate the overall cost of protectionism, its rent. Rent in economics may
first be defined as any payment to a factor of production above the level of the cost needed to bring that factor into production. Different from accounting profit, it is the benefit received for an input which hasn't been produced by labour. This input might be an inherited ownership, an official privilege, a guild, or any kind of corruption. Any set of regulations instituting special authorizations, such as quotas, creates a rent. We will further detail in our empirical analysis the various methods used to estimate it.

The main results of the rent seeking research current were based on scarce statistics, generally for a couple of years, for Third World countries of the 1950s and 1960s, which had often just gained their independence, and whose administrations weren't mature. In Turkey, in the 1950s and 60s, 6.26 $ of locally-produced concrete was generally needed to buy 1 $ of foreign concrete. In the case of more evolved products, for instance rubber, the ratio became 890 to 1 (Bhagwati 1978). In order to calculate the added price paid to buy quota-imported goods in India, Krueger used a large estimate drawn from the Santhanam committee set by the Indian Congress. It estimated that a company was ready to pay "between 100 % and 500 % of the price" of an import in order to acquire its license. She nonetheless retains a far lower value of 75 % in India and 300 % in Turkey. She then multiplies it by the total quotas, and estimates the cost of quota-induced Indian rent at 7.3 % of the national grossproduct in 1964, to be compared to the rent linked to public infrastructure, three times less, or public industrial investments, credit control or the railway system, ten times less. Quota-induced rent in Turkey would have been equivalent in 1964 to a third of the trade deficit, and in 1968 to 15 % of GDP. Studies focusing on the protectionist rent in developed countries are scarce, and provide very vague numbers. For instance, American quotas on textile imports from Hong Kong would have cost the American consumer between 15 and 50 % of the import price (Krishna, Erzan et al. 1991).
Analyses in terms of rent capture seek to identify and quantify the capture of a policy by particular interests. First, rent capture interests companies, as quotas would favor oligopolies and monopolies. In India in the 1950s and 1960s, big companies were receiving 85% of their quota demands, against 35% for small companies. Isolating the domestic market from foreign competition, quotas would protect existing monopolies (Krishna, Erzan et al. 1991). The American cheese import quotas of the 1980s were owned at 95% by five big companies (McCorriston 1996). Rent capture also interests geographical spaces. In Pakistan, between 1953 and 1956, Karachi’s share in quota allocations was between 57 and 89% of the total, whereas its part in the global added value was only of 30%. Diaz-Alejandro showed how the Colombian import control organization was advantaging the companies from Bogota and Medellin. Third, administrative processes may favor such or such administrative group, or even such and such social group at large. This never gave way to any estimate. The question to know if a quota regime may be more favorable to a part or the other of the political class remains undecided in the literature (Anderson and Neary 1992).

Many of the researchers of the rent seeking movement came to work for international organizations such as the World Bank. Following these researches and the examples of Taiwan and South Korea, import substitution has been, from the 1970s, rejected in favor of export-promotion. However, a global view on the income growth of emerging countries, excluding China and India, notably in the industrial sector, since 1970, would conduct towards reassessing the idea that the shift to an export-promotion strategy would have really been beneficial (Bruton 1998). As a result, the rent-seeking critics of import-substituting industrialization have themselves been criticized from the beginning of the 1990s.

The main problem of the researches on protectionism is that they most often analyse a supposedly centralized, government-planned coordination, captured by rent seekers from the outside. They don't
explain the endogeneity of rent seeking in the construction of development policies. A perspective of economic history is thus required, an empirical and detailed analysis of the agents, organizations and companies concerned by these policies and seeking a profit out of it in the long run.

The study of French oil protectionism stands out for three reasons. First, contrary to the cases studied by Krueger and Bagwhati, it created extensive data and historiography. This allows a long term continuous measure of the efficiency of the policy as well as of the industrialization rent and rent capture of quantitative protectionism, which was thought of and organized as a long term policy. This has never yet been achieved (Anderson and Neary 1992). Second, the literature on quantitative protectionism actually leaves in the shadow the most important trade volumes subjects to trade restrictions during the 20th century, which were European trade flows. Compared to other European countries, France built the earliest, biggest, and longest quantitative protectionism system, and stands out as a good case study. Third, if we wish to assess the efficiency of protectionism for emerging countries today, we cannot do it by comparing today's Chinese administration to the one of Guinea in the 1960s. We need a more experienced administration, of which France is a good example. Indeed, oil protectionist policies played a key role in the construction of the modern French administration in the 20th century.

**IV - THE HISTORY OF FRENCH OIL**

The oil refining industry is, from the end of the 19th century, a leading, high-technology industry, born in the United States. Two French laws create, in 1881 and 1903, customs duties particularly favorable to the Anglo-Saxons in that matter. This explains the absence of refining in metropolitan France at the eve of the First World War (Philippon 2004). Two thirds of all imports were operated by the Standard Oil of New
Jersey, the last third mainly by “André et fils”, a company with a dominant shareholding of Royal Dutch Shell, together with Russian interests. During the First World War, import licenses are put into place. Imports are shifted from the Standard Oil of New Jersey, which attempts to raise its prices, to Shell, which ensures supplies and is subsequently perceived by many French actors as a supporter of French interests.

After the First World War, State control of imports is continued through general import authorizations by company and by product. At the beginning of the 1920s, several strategies to develop French refining and secure steady and cheap supplies are considered by the French parliamentarians. The solution of a "delegate import monopoly" is chosen by a law in 1926. It continues the licenses, oil customs duties remaining low. The oil expansion of the beginning of the 1920s is followed by a recession, and by growing cartelization processes, notably in the United Kingdom (Jones 2010) and the United States (Ferrier and Bamberg 1982). The informal “As Is Agreement”, decided at Achnacarry in 1928 by the Seven Sisters, convened that all oil products were to be sold worldwide considering their distance from the Gulf of Mexico. This created extra-revenues for the majors from Near-East oil, which was closer to Europe. A conference of the Seven Sisters in Paris in 1929 also includes Romania in the arrangement.

The interwar political economy of French oil goes well beyond a simplistic opposition between the cartels of the majors and the European States. Complex games of alliances between companies, banks and administrations created transversal groups of interests. In France, a first alliance was organized in the 1920s around Paribas, probably the most powerful European bank of the time, a syndicate of bankers of Amsterdam and Paris (Bussière 1993), and Standard Oil of New Jersey. The main heir to Rockefeller's empire, Standard tries to regain its lost position from before the war, and to develop its retail network in France. Paribas wants to refine in Romania the crude extracted by the company Steua Romana, of which it has inherited the major part from the Deutsche Bank after the First World War. It chooses to build wells
and refineries in Romania in order to import refined products in France, to be distributed by Standard. This also took part in the global rear-alliances strategy of the French Foreign Ministry against Germany. French imports of finished products effectively shift in the 1920s from the US to Romania. The alliance originally proves itself economically profitable, but ultimately fails. The Romanian State bankruptcy of 1929 leads Romania to supply its oil back to Germany from 1936 (Marguerat and Jílek 1987).

After Romania, French oil imports begin to shift to the Near East during the 1930s. The mining engineer Ernest Mercier calculates that Near-East oil would be cheaper to extract. He gradually chooses this option, supported by the Parisian Union Bank (BUP). BUP was analysed as an arm of the French banking and financial community to resist the power of British merchant banks and financiers (Bonin 2001). Strongly associated, notably through personal links, to the Finance ministry, which seeks a decrease in oil costs, it starts financing Shell's activities in France. Shell, a legally British-Dutch company, asserts the fact that the majority of its equity is owned by little shareholders, and that the majority of those would be French. This leads to the creation of the French Oil Company (CFP), a company originally dominated by the French State, BUP and Shell, in order to manage the French part of the Irak Petroleum Company inherited from the Deutsche Bank after the First World War. The CFP holds a majority stake in the French Refining Company (CFR). The beginnings of CFP are difficult, the company starting a small production only in 1934.

The "law of 1928" creating oil import quotas was born out of a will to manage the transition from a Romanian, refining abroad, solution, to a Near-Eastern import substitution solution. It was prepared by the socialist MP Baron and the Radical (center-left) Magaine. Baron wanted a license system, and Magaine a public monopoly owned at 50 % by the State. During the parliamentarian debates, the communists presented the law as “an instrument for the French merchant banks, accomplices of the English and American trusts”. The socialists also opposed the law, accusing the right-wing government of “presenting
as a monopoly configuration a setting of dispositions which are in absolute contradiction with the principle of State monopoly”. For the Radicals, the law was just a continuation of the fact that the importers had already set informal quota agreements. The conservative MPs went as far as to present the law as an instrument against uncompetitive agreements. They stated that the Geneva Convention of 1927 against restrictions of trade couldn't apply to a law which had been prepared before it by the law of 1926. The law is finally voted at the end of the parliamentary mandate, so as to quash debates¹.

The aims of the law of 1928 are to control imports and refining of oil and to create the conditions for an « equitable competition on the domestic market ». Quotas are allocated by a jury of the National Liquid Fuel Office, which gathers officials from various ministries and companies. Production quotas are set for each refinery. Importers must stock 40 % of their annual sales and have at least one refinery on the west coast in case of war. The president and half of the administration board and of its navy have to be French².

Oil, which only accounts for 5 % of total French energy consumption in 1929, sees its uses rapidly expanding during the 1930s. Domestic refineries produce 88 % of French supply needs at the end of the decade. The imports done by the majors are regularly growing, but, in 1937, imports of finished products in France only represent a fifth of crude imports. The situation is reverse in Germany and the UK (Bamberg 2000). In parallel with this expansion, a specific personnel builds itself, structured around the “Corps des Mines”, an elite administrative body of mining engineers selected among the best students of the Ecole Polytechnique, nicknamed the "X-Mines".

² Annales de la Chambre des députés, Documents parlementaires, Tome XXIII, January to July 1928, appendix 2589.
The Second World War and the immediate after-war period witness a transformation of the sector, organized by the State, around the law of 1928. The National Liquid Fuel Office becomes in 1939 the Fuel Division of the Ministry of Industry. The nazi-collaborating Vichy regime creates the "Régie autonome des pétroles" (RAP) and the "Société nationale des pétroles d’Aquitaine" in order to manage the interruption of supplies (Beltran 1998). In Free France, the major event is the meeting of Pierre Guillaumat, member of the Corps des Mines, and Charles de Gaulle. They create in 1945 the Oil Research Bureau (BRP) to prospect oil in the French empire, notably in Algeria. French refining capacity is reduced in 1945 to 20 % of its pre-war situation. The coal alternative raises the problem of a rising communist movement among the miners. In order to rebuild the industry, the French State grounds its new interventionist policy on five main axes.

The first axis of the afterwar French oil policy was geographical, with repeated shifts of supply sources, first from the United States towards the Middle-East, then from the Middle-East towards Algeria, then from Algeria towards a mixed solution, with Middle-East, Algeria, French-speaking Africa, Venezuela and Canada. A key moment was the discovery of oil in Algeria, in 1956, which brought a response to the Suez supply crisis. The extraction begins in 1959. A company, the General Oil Union (UGP), directed by Guillaumat, merges several distributors to distribute this oil in France. From 1965, the newly independent Algerian State buys 50 % of the semi-State oil extracting company SN-Repal by supplying free crude during two years to France for a value of 150 m Francs.

A second axis was industrial. It consisted in the integration around big companies, first, during the 1950s, BRP, RAP and CFR, with the private company Desmarais trying to play a role (l'Huillier 1990), then mostly CFR and UGP, later to become Total and Elf. The third axis of French oil expansion after the war

\[1\] See Brault, Julien, *The International Transactions of France from the 1920s to the 1970s* for detailed data on the geographical evolution of French oil imports.
was a technical catch-up process. The afterwar dollar gap was caused by European destructions, but also by a growing technical advance of the US in catalytical cracking, which dramatically accelerated the production of gasoil (see notably United States Federal Trade Commission 1952, Murat 1969, and Painter 1984). The French needed in that respect to increase both the capacities and profitability of their oil industry.

A fourth axis was the importance of social-administrative groups. The first director of the Fuel Division, Pierre Guillaumat, from the Corps des Mines, appoints at his side numerous comrades, the “Buddhas” (Philippon 2004), but also the first cohorts of the newly created National School of Administration (ENA). The most recent research on the subject accuses the Corps des Mines of having captured French oil profits, before being defeated by the ENA (Yates 2010). The fifth axis of the French oil industry after 1945 was linked to a broad interventionism based on quotas. The quotas are tightly linked with monetary policies aiming at filling the dollar gap. Notably, the “Franc-Oil” Agreements of 1952 compel foreign companies importing Middle-East crude to a 25 % payment in francs (Murat 1969).

French oil protectionism died from attacks led by the European Commission, the United States, the oil majors, and French justice. The execution of the Treaty of Rome of 1957 legally forces France to geographic non-discrimination in quota allocations. The European Commission and Court of Justice try to abolish the quotas in 1962 and 1963. Shell sues the French quota system in the State Council in 1964, but loses. The Commission finally gives France delays until 1973 (Philippon 2004). Domestic political problems linked to rent seeking particularly stand out at the time. In 1971, the head of a small oil company from Marseille, Bodourian, sues the big oil companies after his bankruptcy, accusing them of having

refused him normal supplying conditions. Several medium-size French cities associate themselves to the affair to denounce a Parisian favoritism. An official enquiry reveals that many public oil markets are organized by secret market-sharing agreements between big companies, but is buried by the government (Philippon 2004).

At the eve of the oil shocks, France had found its energetic independence and become the second largest exporter of finished products after the US. Last finished products quotas apply from 1977 to 1980, then are automatically increased following consumption. Last crude quotas are run between 1975 and 1985, when they are officially abolished. The law of 1928 is finally repealed in 1992. The archives and data of the quota system are finally sent to the French National Archives and the Archives of the French Finance Ministry. They allow the researcher to assess the overall efficiency of this policy.

V - DATA AND INDICATORS

The French oil protectionist system, apart from minor changes, followed the same legislation from 1928, allowing long term comparisons. French oil import quotas have been allocated thirteen times. The note of Appendix 1 details the allocation dates. They are preceded between 1914 and 1928 by case per case licenses, then interrupted between 1939 and 1950 and replaced by case-per-case licenses, which have not been found in the archives. Two types of quotas exist. The “A20s” apply to crude as well as to finished products, but only to refiners, on average 25 big companies. They are annual quotas allocated at intervals of 20 years, then 15 and 10 years after the war, yearly increased or decreased by the same percentage for all companies, "following the evolution of consumption" (law of 1928). This percentage was arbitrarily fixed
and has not been found in the archives. We therefore retain the actual evolution of consumption to extrapolate the amount of global quotas during the intervals.

The “A3s”, initially allocated every 3 years, concern all the oil companies, between 60 and 400 refiners and distributors depending on the year. They are also annual, concern only finished products, involve amount limitations for some products, and are for the other part global authorizations per products without specified amounts. We extrapolate global quotas in the intervals in the same way than for crude. On average, gas stands for 90 % of quotas and actual imports. The only significant other product in volume is gasoil, which is for certain years only subject to general authorizations without quantity limits, notably during the second half of the 1950s. A20s and A3s are decided at allocation dates, in volume, per companies and products. They are not transferable, sellable or auctionnable. When A20s and A3s quotas per products are aggregated into general oil quotas per companies, including subsidiaries, the final count is 1917 quotas from 1929 to 1980, i.e. an average of 147 quotas per allocation dates.

Aside from the archives of the quota system, yearly oil statistics have been compiled by the French Oil Professional Committee, one of the main associations of oil companies, and the Lesourd Editions, which published yearly professional inventories destined to the profession. Bearing in mind the limitations of these sources in terms of missing data, they nonetheless allow to create far more complete and continuous series than other researches on quantitative protectionism.

Our strategy of quantitative analysis is grounded on the largely theoretical literature on quantitative protectionism. First, classical analyses of protectionism debated extensively on the optimal indicator of

1 For the detailed information about which product is subject to quantity limits and which one is not, per year, please refer to Brault, J, *The International Transactions of France from the 1920s to the 1970s*, unpublished PhD thesis, Graduate Institute of International and Development Studies, Geneva.

2 See the note of Appendix 1 for more details on these sources.
trade protection. Of these researches stand out the idea that all the means of protection have to be considered, notably customs fees, domestic taxes, support payments, and trade quotas. A popular trade protection index, the Trade Restriction Index, aims at measuring the difference between an optimal, welfare maximizing, protection, and the actual protection (Anderson and Neary 1994 and Neary 2005). One of its problems is that it only works for a small country having no influence on world prices. This may well not be the case for France, which gradually becomes the second largest exporter of finished products in the world. A global measure of welfare effects à la Neary could be developed in further researches. In order to examine the classical efficiency of the French oil import substitution policy, we choose first to build a simpler trade protection index.

Our trade protection index is built as follow. We first compute a global tax rate as the ratio between total taxes before sale and the effective average import price of finished products as recorded by the French National Statistical Institute. The taxes encompass customs fees and different types of domestic taxes, some in volume, some ad valorem, some fixed fees per transaction. Concerning the quotas, the authorized quantities are most of the time actually above the quota demands. This does not mean that all individual quota demands are authorized. Many of them are capped, but, conversely, a lot of them result in higher authorized quantities. If we extrapolate the allocation dates to the entire allocation intervals of A3s, the global authorized quantity is below the global asked quantity only for two periods, during the period of interwar protectionism from 1935 to the First Word War, and again during the beginnings of Algerian oil from 1959 to 1961. In turn, this doesn't mean that the system wouldn't have been restrictive for the other periods. Indeed, as stated by Krueger and Bagwhati, a large part of the restriction of quota systems comes from an ex ante selection. As we will see, the long term evolution of our indicators suggest this is the case. For the openly restrictive periods, we multiply the global tax rate by 1 - the rate of refusal of quota
demands in order to obtain our trade protection index. For the rest of the period, the trade protection index corresponds to customs fees and domestic taxes.

We put this trade protection rate in parallel with four indicators which synthethize the aims and steps of an import substitution policy. These are the savings, approximated by the equity of firms, the production capacity of the industry, the concentration of consolidated firms, and the financial returns of the industry. The reader may refer to the notes of the appendices for details on the means retained to compute those indicators.

Second, the rent seeking current, in order to evaluate the macroeconomic cost of the policy, used several possible measures of what we choose to call, by convention, the industrialization rent. Out of the extensive literature, we distinguish two measures of the industrialization rent, which are the import substitution rent, and the technocratic rent. The import substitution rent measures the difference of prices of production inside and outside the country. Krueger and Bagwhati measured the cost in domestic resources required to earn one unit of foreign currency in the considered protected industry, compared to that cost in another industry (Edwards 1993). They also compared the world mean added value of the considered industry and the mean domestic added value. Applied to a series of emerging countries for the 1950s and 60s, this gave much higher ratios than a nominal industrialization rent measuring only retail price differences (Edwards 1993). Computing a world average added value in one set of industries on the other hand proves itself very difficult in terms of access to data.

We therefore retain an index based on prices for our import substitution rent, which already requires to compute a large number of variables, since oil prices are composed of many parts (see Appendix 4). We estimate the import substitution rent as the cost of the choice of domestic production compared to a total import dependency in terms of prices, i.e. what imports at effective import prices would have allowed the
French consumers to earn compared to a domestic production estimated following export prices. The effective import prices are computed by subtracting from the official import price the transport fees, customs duties, domestic taxes, and returns on investments.

The technocratic rent reflects the profits of the State related to the specific industry, and the profits of companies. Our indicator assesses the technocratic rent as the sum of the State's direct profits, i.e. oil taxes, and the companies' profits, encompassing the existence of stocks, and deducting from it oil investments. Most of the French oil sector was public for the largest part of the period, and our data on companies' added value cannot be decomposed by companies. Therefore, we cannot really distinguish the technocratic rent of the State from the one of private companies. Nevertheless, a decomposition of the price of gas allows to picture fairly the evolution of official taxes, corporate profits, returns on investment, and the share of international transport as well as profits recorded abroad.

In the spirit of the import substitution theory, the import substitution rent as the cost of the policy, and the technocratic rent as the gains made out of it by its various actors, should be more or less the same, at least at the beginning of the system. A difference between the two would hint at profit capture in favor of the State and oil companies. Inside the technocratic rent, a certain share should then be captured in a biased way by rent seekers.

Concerning rent capture, looking at the works of Krueger and Bhagwhati, their used indicators are fairly simple. They compare ratios of obtained quotas, depending on the company asking the quotas and the localization of its headquarter. For the power of social groups, they remain pretty vague and don't provide statistics. We distinguish economic, geographic, and social-administrative rent capture. The legislation stated that only the global quota for all companies was modified every semester in the interval between quotas, not the shares of every company. Since it is improbable that a company's equity and location would
have dramatically changed in three years, we extrapolate rent capture over the quota intervals. Economic rent capture is calculated as the cost of the bias benefiting big companies, i.e. the cost of finished products which would have been imported if small companies had had the same quota/equity ratios than big companies. Geographic rent capture is calculated as the cost of the Parisian bias, or the cost of finished products which would have been imported if small non-Parisian companies would have been able to import with the same quota/equity ratio than the one of the small Parisian companies.

Concerning social-administrative rent capture, as suggested by Krueger's and Bagwhati's researches, it is not obvious to find refined sociological data to calculate the weight of social groups on a protectionist policy. One possible way to calculate social-administrative rent capture would be to link the curricula of jury members to the curricula of the members of the administration boards of companies. By curricula, we mean the universities the civil servants and businessmen came from, their possible political affiliations, their past work experience, all in all everything in their curriculum vitae which may hint at their belonging to such or such social group with connections. We gathered this data for jury members. Unfortunately, we didn't find at this stage comprehensive sources for curricula of members of French oil companies administration boards in the long run.

Considering this limitation, we tried to find potential visible links between all our variables and the presence rate of more than twenty recorded curricula of the members of juries. Only two visible links stood out. The first one was a visible positive relation between the concentration of allocated quotas and the presence rate of the X-Mines, former students of Polytechnique and/or the Mines School. The second one had to do with the protection rate (Appendix 5). A scatter plot with the presence rates of the X-Mines and SciencesPo-ENAs, and the trade protection rate, shows that the increase in protectionism of the middle of the period corresponds to high shares of X-Mines and low shares of SciencesPo-ENA. Conversely, the
decrease in protectionism corresponds to a bigger role of the SciencesPo-ENA, and the decreased importance of the X-Mines. Regression lines illustrate this tendency. To put it in a schematic way, as suggested by the existing historiography, the more X-Mines in the juries, the higher the protection rate. The more SciencesPo-ENAs, the lower the protection rate.

As a result, we imagine what would have happened to the protection level, and hence to imports, if the SciencesPo-ENA share had been set at the same level than the one of the X-Mines, and conversely, assuming a perfect correlation between the protection rate and the presence rates of those two groups. We then compute the difference between these virtual imports and the effective imports. In the absence of most comprehensive data on the presence of social-administrative groups in companies, this at least gives a general idea of the level of the rent shifts linked to fluctuating social-administrative shares in juries and related stands on trade protection, which is a legitimate end. This is already a good achievement, considering that the literature provided at this stage only very scarce statistics in this matter.

**VI - RESULTS**

We present our results in three steps. First, we show how our data allow to bring forth a new narrative of French oil, deepening the existing historiography. Second, we examine our classical indicators of protectionism. Third, we present the results of our rent seeking analysis.

First, a new narrative of French oil can be built out of our empirical analysis based on State's archives, using and complementing the existing historiography mainly based on companies' archives. The constraints applied to imports by the quota limits are pretty clear (Appendix 1). The rise in Algerian imports after 1959
stands out sharp in comparison with the constrained crude imports of the 1930s and 1950s. The rise in finished products imports stabilizes from the middle of the 1930s as it meets the quota limit. More than half of the quota demands are refused in 1935. However, after a steep rise, the trade protection rate follows the fall in domestic taxation during the second half of the 1930s. As the war draws near, the importance of oil supply rises, and the refusal rate of quotas is cut down in 1938.

French oil protectionism did accompany the beginning of finished products production in France, out of nothing (Appendix 2.2). Detailed allocation biases show the shift from the Romanian to the Middle-East strategy (Appendix 5). The only big French private company Desmarais is advantaged throughout the period. A rising advantage for Shell-BUP ceases at the end of the decade. Paribas-Standard's advantage falls down continuously. This confirms the narrated relative failure of the transition policy from Romanian refineries to Middle-East imported crude during the 1930s. Moreover, if sales seem to indicate the beginning of concentration in 1932, which was a proclaimed objective of French oil policy makers, quota concentration actually decreases throughout the decade, concentration of equity remaining stable (Appendix 3). The proclaimed objective to create a concentrated market around national champions clearly appears to have failed. The growth rate of average equity waits until 1936 to go slightly above 10 %, stabilizing before being interrupted by the war.

During the 1950s, trade protection goes through a big increase (Appendix 2.1). As the cost of domestic refining and transport goes down, domestic taxes go up (Appendix 4.2). This global increase appears however very chaotic. The quotas of 1950, which represent less than half of the imports of 1949, clearly aim and succeed at dramatically curbing the flows of imports of American finished products. This pressure is alleviated in the middle of the 1950s as the French production capacity gears up (Appendix 2). The quota
limit is again met in 1955. As gasoil is set off limits, imports gear up by 30% in a year, before the big surge of Algerian oil.

The afterwar efforts of the juries to restore the position of French groups in finished products from the interwar is clear. In a first phase, juries choose Shell against Standard, like in the 1930s, but the main difference is the successful emergence of three big French groups, Desmarais, CFR and UGP, and the bigger importance of small French companies. The three big French groups unsurprisingly have the most advantageous quota/equity ratios, followed by Standard. This moment profits to big companies, small companies ratios going down, showing a clear intent at concentration. At the end of the 1950s, the big French groups UGP and Antar have the most obvious biases, followed by Shell and CFR (Appendix 5) as Algerian oil begins flowing in France. After the Suez crisis, quotas clearly try to foster transition towards Algerian finished products from 1959 to 1965.

In the 1960s, the flows of Algerian oil from 1962 meant the end of the high levels of protection of the afterwar. This is also to be explained by the highest prices of imported finished products, which tended to become more and more processed abroad, notably in Algeria. As a consequence, flat taxes on volume tend to represent a lesser rate. Hence, trade protection goes back to its levels of the interwar. From the middle of the 1960s, the duopole Total and UGP, later to become Elf, controls the majority of imports. Quotas remain after that at a control level, slightly above effective imports, throughout the second half of the 1960s and during the 1970s.

In the 1970s, within a tax system with a part of flat tax, the big variations in oil prices following the oil shocks account for the shifts in the rate of trade protection. The situation shifts gradually towards a ranking more in line with the actual international importances of companies at the end of the 1970s, placing first Shell and Standard, followed by the French duopole Total-Elf. All in all, this new narrative shows that
quotas had a real quantitative impact on French oil imports, and clearly tried to implement a broad and detailed strategy of import substitution and industrial development.

Second, our data allows a classical analysis of the efficiency of protectionism. First, the regular afterwar rise in protection is initially followed by a fall in returns (Appendix 2). It is only Algerian oil, coupled with a big increase in protection, which fosters an increase in returns. After the Algerian moment, it is when protection falls back to its interwar levels that returns know their biggest increase.

Problems with the policy appear as soon as the second half of the 1950s, the big rise in average equity and production capacity coming to an end. Juries foster the transition to Algerian oil by gearing up the protection from the rest of oil imports. Algerian oil also propels returns to their high levels of the 1960s. Again, Algerian investments of the beginning of the 1960s foster the last big increase in production capacity before the oil shocks. What is interesting is that, for the 1958-1962 period, the protection rate doubles, but the capacities growth rate does not follow it, or else lately and ex post, even accounting for the flows of Algerian oil. This peak in protectionism doesn’t seem to have been justified in the medium run.

The policy also created problems of products substitutability. In 1953, when gas quotas are increased, gasoil imports diminish. After 1956, new gas quota limits, and the fact that gasoil is put outside quota limits, cause an increase in gasoil imports. Comparably, gasoil chaotic evolution in 1932, then between 1962 and 1965, are very probably linked to import restrictions. Again, Algerian investments of the beginning of the 1960s foster the last big increase in production capacity before the oil shocks. What is interesting is that, for the 1958-1962 period, the protection rate doubles, but the capacities growth rate does not follow it, or else lately and ex post, even accounting for the flows of Algerian oil. This peak in protectionism doesn’t seem to have been justified in the medium run.

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Looking at industrial concentration (Appendix 3), high trade protection didn't foster equity concentration during the 1930s, and sales concentration, after a surge, actually goes down at the eve of the war. The afterwar progressive increase in trade protection doesn't foster a high equity concentration either. Its is the

concentration of distribution, as shown by sales, which is apparent, showing the juries' intentions to develop French distribution. It is only after the Algerian moment that equity knows a steep rise, following the increase in protectionism of the 1970s. Higher industrial concentration does not follow a highest rate of quota concentration. It is coming from the formerly detailed subtler microeconomic strategy at the firm level.

Third, our data allow a rent seeking analysis. Concerning the import substitution rent, the inverted U-curve appears clearly during the 1950s and the first half of the 1960s, showing the success of the policy in its core indicator (Appendix 4). After the Algerian moment, the import substitution rent nearly disappears. On the other hand, the technocratic rent remains at the same level until the end of the 1960s, hinting at a remaining cost of technocratic structures, and particularly of the State. This ongoing cost goes beyond what would have been a simple refunding of past investments. The renewed industrialization rent of the 1970s seems a lot more chaotic and linked to big external variations in supply and prices caused by the oil shocks.

The decomposition of gas prices allows to estimate the shares of the State and of oil companies in the technocratic rent (Appendix 4.2). We witness the clear shift from foreign-based corporate profit to a State oil rent in the interwar. The State's share increases during the afterwar until the Algerian oil. It starts decreasing only at this point, although the companies' profits do not increase as a result. A big part of the oil shocks are then absorbed by a significant decrease in oil taxes.

Economic and geographic rent capture represented respectively a yearly average of 4 and 5 % of the industrialization rent, which explained the big stakes they could have been from a microeconomic point of view for certain companies and certain cities, as it appeared during the Bodourian affair. Nonetheless, their cost remained limited from a macroeconomic point of view, remaining below 1 % of GDP (Appendix 6). This is especially true during the 1930s. Their high moment corresponds to the middle of the 1950s.
Geographic rent capture after that definitively decreases. On the contrary, economic rent capture, after a low point, increases again in the second half of the 1960s, hinting at renewed rent capture, before definitively decreasing as well. Detailed results of rent capture show that, for a company, being located in a provincial town in 1932 was better than being located in Paris in order to obtain a good quota/sales ratio, but that the situation reverses itself at the eve of the war (Appendix 7). The same pattern occurs after the war, the Parisian advantage remaining impressive in the long run.

Social-administrative rent behaved in an opposite way, both in terms of level and trend. The high level of social-administrative rent capture during the period, a yearly average of 2,4 % of GDP, i.e. more than half of the industrialization rent, shows the width of the changes in the weights of the two main groups and in trade protection rate. 1959 again stands out as a key year. As economic and geographic rent capture shift down, social-administrative rent capture gears up. Following the way we built this indicator, this corresponds to a slight increase in the weight of the X-Mines, but, more than that, to a more significant entrance of the SciencesPo-ENA in the juries. This is accompanied by a decrease in economic and geographic rent captures. Trade protection rose sharply, but only to come back immediately after to its interwar level, from 1962, as the X-Mines are replaced in the juries by the SciencesPo-ENA.

All in all, the two inverted U-curbs of economic and geographic rent capture peak in 1957. They are followed by the peaks of trade protection, industrialization rent and social-administrative rent capture, before a decrease. The changes in the social-administrative composition of juries hence account for a key shift in the system of protectionism.
VII - CONCLUSION

Krueger interpreted quantitative protectionism as an initially centralized system gradually captured by private interests. Our study shows, on the contrary, that this policy was born in the 1920s out of complex and transversal games of public and private interests. Quota juries acted as a trade-off platform between these interests in order to escape international cartels through State institutionalization and its correlate, the production of information and statistics, notably in the 1950s. Following a peak of rent seeking at the end of the 1950s, they went further down the road of State institutionalization by separating the oil civil service from the oil business. This evolution led in the long run to the abolition of the system by the central State and the European institutions in order to complete a process of de-capture.

In terms of cost, a comparison of our rent indicators with other variables shows that the French oil policy probably cost in the long run more than what it allowed to gain from the point of view of the sector in itself (Appendix 8). The French trade balance from 1914 to 1989 represented a yearly average deficit of 1,1 % of GDP, the oil sector added value in the 1950s and 1960s an average of 2,7 % of GDP. An oil industrialization rent at 3 % of GDP shows the width of such a cost for the French economy.

But the gains exceeded this cost by far. The observable fine tuning of progressive industrial concentration allowed by the quota system indeed led to the creation of two, then one major, Total S.A., a unique feature in non-Anglo-Saxon countries. Total's turnover goes today above 9 % of French GDP. More broadly, oil fueled a major part of French afterwar growth. The evolution of the industrialization rent as an inverted U curve reflects the way the system was controlled and geared towards economic success in the long run.
Contrary to Krueger and Bagwhati's researches, in France, a country with a higher stage of development and a more mature administration, quantitative protectionism was macroeconomically efficient. The real problem with quantitative protectionism was indeed an issue of political economy and rent capture, but not in the way Krueger saw it.

The costs of the policy in terms of rent seeking weren't linked to the raw economic amount of rent capture by dominant companies or central geographical spaces. They came from regularly changing choices on the level of protection linked to pressure groups, which brought imbalances to the French development model. Through their presence in quota juries and subsequent influence on the setting of the global oil trade protection rate, the two main social-administrative groups of the SciencesPo-ENAs and the X-Mines were conferred control on more than half of the rent. This rent was a major source of revenue for the State, and whoever controlled it controlled a big part of the national administration. The struggles to control this rent increased the political instability of the Fourth Republic. Collectively, the industrial accomplishment of the system, and hence its inevitable end, appeared clearly, but, individually, none of the groups involved was willing to risk losing the rent to the profit of others by ending the system.

In this context, Algerian oil, which was set outside quotas, allowed to temporarily escape the locked-in imbalances of the system of the French rentier-State economic interventionism. As such, it acted as a live test of the end of the import substitution policy, without an actual institutional end, and convinced its key-players of the necessity of its ultimate abolition. The various French players thus had an important economic interest in delaying Algerian independence in order to ensure the stability of a main axis of French economic policy. Renewed imbalances in rent capture in the middle of the 1960s showed the political limits of such a system in the long run, and led to its abolition.
As a conclusion, it is not because of a failure of import-substituting industrialization from the point of view of its macroeconomic cost that the system mutated, on the contrary, but in order to end these imbalances and the political risks they created for the country, particularly underlined by the situation between 1958 and 1960. It is no surprise that, in a country close to civil war, the head of French oil policy, Guillaumat, became Minister of the Armies, underlining the entanglement of French oil protectionism in the international political economy of rent seeking.

References


Anderson, J. E. and J. P. Neary (1992), "Trade Reform with Quotas, Partial Rent Retention, and Tariffs." Econometrica 60 (1) : 57-76.


Bhagwati and Desai (1970), India : planning for industrialization: industrialization and trade policies since 1951, Oxford University Press.


**Consulted archives**

Bank of France - Chamber of Commerce of Paris - French Finance Ministry - Total S.A. - Departmental Archives of Paris - French National Archives
Appendices

Appendix 1: Quotas and effective imports, in million tons (see note on next page)

1.1: Crude

1.2: Finished products
Note: The quotas for refiners ("A20s") were allocated in 1932, 1950, 1965 and 1975. The quotas for resellers ("A3s") were allocated in 1929, 1932, 1935, 1938, 1950, 1953, 1957, 1959, 1962, 1965, 1968, 1971, 1975, and 1977. The global quota was allegedly increased during the interval "depending on the evolution of consumption (of finished products)". We therefore extrapolate the global quotas with the yearly change in the domestic consumption of finished products. The differences between global quotas and actual imports come from two reasons. First, some categories of oil products, notably gasoil, are during certain periods subjects to general authorizations without limits. These quantities are therefore not encompassed in the quota statistics. Second, the army is out of the quota system. Quotas are drawn from Lesourd's *Oil Guide*, the yearly statistics of the French Oil Professional Comitee, the French Official Journal, the French National Archives, and the Archives of the French Finance Ministry. Effective imports are drawn from the official trade statistics of the French National Statistical Institute (INSEE) and the yearly statistics of the French Professional Oil Comitee (Comité Professionnel du Pétrole). Overall, contrary to the cases studied by Krueger's research team, the French quota system produced extensive data sources, whether directly through its allocation procedures, and more so indirectly through the yearly professional statistics aiming at organizing the transparency of the sector in its bids to competitive quota allocations. This situation led to the production of detailed, firm-level as well as sectorial data. This data was way ahead the statistical production of the central State, especially during the interwar, when the latter wasn't even officially producing balance of payments statistics, and even during the 1950s and 1960s. The French National Statistical Institute began producing systematic firm-level data only from the 1970s. As any statistical production, the data is incomplete, and tends to reflect those companies which were applying to quotas. For more precision on the sources and the types of oil products subjects to quantitative restrictions by year, please refer to Brault, Julien, *The International Transactions of France from the 1920s to the 1970s*, unpublished PhD thesis, Graduate Institute, Geneva, available online.

Appendix 2: Classical analysis of the efficiency of import substitution (see note on next page)

2.2: Trade protection rate and returns
2.2: Production capacity and capital

Note: The trade protection rate is equal to: \( \text{global tax rate} \times (1 + \text{refusal rate of finished quota demands in volume}) \). The global tax rate is the share of customs fees and domestic taxes in the final selling price of gas in Paris or Rouen, depending on the year. The domestic taxes form a complex and changing set of fixed sums by volume and ad valorem rates. The returns are equal to the ratio between the added value of the oil sector and its investments on the same year. The added value includes the taxes perceived by the State. The investments include the balance of oil stocks. Data comes from Lesourd's *Oil Guide*, the yearly statistics of the French Oil Professional Comitee, the French National Archives, and the archives of the French Finance Ministry.

Appendix 3: Trade protection rate and industrial concentration (see note on next page)
Note: For details on the construction of the trade protection rate, see appendix 3. Concentration indices are Herfindhal-Hirschmann indices consolidated by industrial groups. We only encompass the equity and sales of those companies which had at least part of their quota demand accepted. When less than 25% of the data for equity, sales or quota is available, the data is considered missing for the year for the considered variable. Data comes from Lesourd's *Oil Guide*, the Oil Professional Comitee's yearly statistics, the French National Archives and the archives of the French Finance Ministry.

Appendix 4: Industrialization rent (see also next page)

4.1: Import substitution rent and technocratic rent, as percentage of GDP

Note: The import substitution rent reflects what would have been the cost of a completely domestic production of finished products in France during the period. It is the difference between the price of the domestic production estimated via import prices (domestic production in tons multiplied by import prices) and estimated via export prices. The data for gas is extrapolated for all finished products. The technocratic rent is equal to the total added value of the sector. The added value of the sector is equal to the revenues of oil taxes plus the added value of the companies, minus the public and private oil investments and the public and private balance of oil stocks. Oil taxes include domestic taxes and customs fees.
Decomposition of the price of a ton of gas sold in Paris, in constant francs

Note: The price in extracting area is the average of the departure prices of the main oil ports in the Persian Gulf. Other geographical possibilities are all close to zero compared to other costs. The cost of transport comes from Interscale and Worldscale. It is the average cost to ship a ton of oil from the oil ports of the Persian Gulf. Other geographical possibilities don't change much to the shipping cost. The cost of domestic refining and domestic transport is approximated by computing the total of corporate and public oil investments per ton of sold gas. In the case of imported gas, it is subject to domestic re-refining and industrial processing as well as commercial distribution. Domestic taxes here do not encompass customs fees, which are in any case negligible compared to other costs.

Appendix 5: Role of the Corps (1950-1962) (see note on next page)
Note: The SciencesPo-ENA group also encompasses the members of parliament, members of the Finance Ministry, Finance Inspectors, and members of the Court of Audit.

Appendix 6: Rent capture (as share of GDP)

Note: Economic rent capture represents the cost of the big companies bias: 
\[ \text{((big companies total finished products quota} \times \text{total small companies equity}) / \text{total big companies equity}) \times \text{average import prices for gas.} \]
Geographic rent capture represents the cost of the Parisian bias for small companies, i.e., excluding the big groups quoted in the paper. Big groups' headquarters are all located in Paris. This gives: 
\[ \text{((Small Parisian companies total A3s finished products quota} \times \text{total non Parisian small companies equity}) / \text{total Parisian small companies equity}) \times \text{average import prices).} \]
Social-administrative capture represents what would have happened to the protection level, and hence to imports, if the SciencesPo-ENA share had been set at the same level than the one of the X-Mines. In other words: 
\[ \text{((ENA share} \times \text{Protection rate}) / \text{X share}) \times \text{Protection rate} \times \text{Imports.} \]

The reverse gives almost the same amounts.

Appendix 7: Detailed biases for finished products quotas (see also next page)

<table>
<thead>
<tr>
<th>Year</th>
<th>Standard Oil</th>
<th>Shell</th>
<th>BP</th>
<th>Mobil</th>
<th>Small companies (mainly French)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quota share</td>
<td>Quota/equity</td>
<td>Quota share</td>
<td>Quota/equity</td>
<td>Quota share</td>
</tr>
<tr>
<td>1929</td>
<td>20%</td>
<td>0.46</td>
<td>11%</td>
<td>0.05</td>
<td>5%</td>
</tr>
<tr>
<td>1932</td>
<td>22%</td>
<td>0.08</td>
<td>17%</td>
<td>0.17</td>
<td>6%</td>
</tr>
<tr>
<td>1935</td>
<td>26%</td>
<td>0.08</td>
<td>10%</td>
<td>0.13</td>
<td>7%</td>
</tr>
<tr>
<td>1938</td>
<td>21%</td>
<td>0.06</td>
<td>8%</td>
<td>0.03</td>
<td>5%</td>
</tr>
<tr>
<td>1950</td>
<td>37%</td>
<td>0.12</td>
<td>12%</td>
<td>0.03</td>
<td>7%</td>
</tr>
<tr>
<td>1953</td>
<td>13%</td>
<td>0.07</td>
<td>15%</td>
<td>0.08</td>
<td>6%</td>
</tr>
<tr>
<td>1957</td>
<td>12%</td>
<td>0.02</td>
<td>19%</td>
<td>2.60</td>
<td>7%</td>
</tr>
<tr>
<td>1959</td>
<td>12%</td>
<td>0.02</td>
<td>13%</td>
<td>0.02</td>
<td>13%</td>
</tr>
<tr>
<td>1962</td>
<td>4%</td>
<td>13%</td>
<td>13%</td>
<td>0.09</td>
<td>13%</td>
</tr>
<tr>
<td>1965</td>
<td>10%</td>
<td>0.05</td>
<td>9%</td>
<td>0.09</td>
<td>6%</td>
</tr>
<tr>
<td>1968</td>
<td>10%</td>
<td>0.06</td>
<td>11%</td>
<td>0.04</td>
<td>4%</td>
</tr>
<tr>
<td>1971</td>
<td>14%</td>
<td>0.04</td>
<td>15%</td>
<td>0.04</td>
<td>6%</td>
</tr>
<tr>
<td>1977</td>
<td>11%</td>
<td>3.79</td>
<td>13%</td>
<td>0.16</td>
<td>5%</td>
</tr>
<tr>
<td>Main French groups</td>
<td>Desmarais</td>
<td>CFR</td>
<td>UGP/Elf</td>
<td>Antar</td>
<td>Total S.A.</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------</td>
<td>-----</td>
<td>---------</td>
<td>-------</td>
<td>------------</td>
</tr>
<tr>
<td></td>
<td>Quota share</td>
<td>Quota / equity</td>
<td>Quota share</td>
<td>Quota / equity</td>
<td>Quota share</td>
</tr>
<tr>
<td>1929</td>
<td>6%</td>
<td>0,23</td>
<td>26%</td>
<td>0,52</td>
<td>4%</td>
</tr>
<tr>
<td>1932</td>
<td>8%</td>
<td>0,33</td>
<td>6%</td>
<td>0,11</td>
<td></td>
</tr>
<tr>
<td>1935</td>
<td>7%</td>
<td>0,29</td>
<td>6%</td>
<td>0,04</td>
<td></td>
</tr>
<tr>
<td>1938</td>
<td>7%</td>
<td>0,16</td>
<td>7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1950</td>
<td>9%</td>
<td>0,15</td>
<td>3%</td>
<td>0,02</td>
<td>3%</td>
</tr>
<tr>
<td>1953</td>
<td>7%</td>
<td>0,24</td>
<td>3%</td>
<td>0,03</td>
<td>6%</td>
</tr>
<tr>
<td>1957</td>
<td>21%</td>
<td>0,54</td>
<td>4%</td>
<td>0,02</td>
<td>2%</td>
</tr>
<tr>
<td>1959</td>
<td>12%</td>
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<td>2%</td>
<td>0,59</td>
<td>6%</td>
</tr>
<tr>
<td>1962</td>
<td>13%</td>
<td>0,14</td>
<td>5%</td>
<td>0,06</td>
<td>2%</td>
</tr>
<tr>
<td>1965</td>
<td>13%</td>
<td>0,22</td>
<td>17%</td>
<td>0,10</td>
<td>11%</td>
</tr>
<tr>
<td>1968</td>
<td>1%</td>
<td>0,02</td>
<td>19%</td>
<td>0,09</td>
<td>7%</td>
</tr>
<tr>
<td>1971</td>
<td>1%</td>
<td>0,02</td>
<td>13%</td>
<td>0,003</td>
<td>7%</td>
</tr>
<tr>
<td>1977</td>
<td></td>
<td></td>
<td>30%</td>
<td>0,23</td>
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</tbody>
</table>

**Quota/equity**

<table>
<thead>
<tr>
<th></th>
<th>Paris</th>
<th>Medium cities</th>
<th>Countryside</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1932</td>
<td>0,1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1935</td>
<td>0,1</td>
<td>0,001</td>
<td>0,001</td>
</tr>
<tr>
<td>1938</td>
<td>0,1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1950</td>
<td>0,1</td>
<td>0,004</td>
<td>0,003</td>
</tr>
<tr>
<td>1953</td>
<td>0,2</td>
<td>0,001</td>
<td>0,0001</td>
</tr>
<tr>
<td>1957</td>
<td>0,2</td>
<td>0,008</td>
<td>0,0001</td>
</tr>
<tr>
<td>1959</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1962</td>
<td>0,1</td>
<td>0,0001</td>
<td>0,0002</td>
</tr>
<tr>
<td>1965</td>
<td>0,03</td>
<td>0,001</td>
<td>0,001</td>
</tr>
<tr>
<td>1968</td>
<td>0,02</td>
<td>0,002</td>
<td>0,004</td>
</tr>
<tr>
<td>1971</td>
<td>0,05</td>
<td>0,004</td>
<td>0,007</td>
</tr>
<tr>
<td>1977</td>
<td>0,5</td>
<td>0,003</td>
<td>0,003</td>
</tr>
</tbody>
</table>

Note: The quota share is the share of the authorized import quota of finished products of the company and the total quota. Standard Oil encompasses before 1945 the industrial alliance with Paribas described in the paper. After, it is Esso. Shell encompasses before 1945 the industrial alliance with BUP described in the paper. All the data is incorporated. The quota/equity ratio per geographical spaces is the global ratio in volume. Paris encompasses the entire contemporary Île-de-France region. The medium cities are Lille, Strasbourg, Lyon, Marseille, Toulouse and Bordeaux.

**Appendix 8: Average yearly rent (1928-1980)**

<table>
<thead>
<tr>
<th>Rent indicators</th>
<th>Share of GDP</th>
<th>Share of industrialization rent</th>
<th>Availability of data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industrialization rent</strong></td>
<td>3,2%</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>Import substitution rent</td>
<td>2,1%</td>
<td>68%</td>
<td></td>
</tr>
<tr>
<td>Technocratic rent</td>
<td>4,9%</td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td><strong>Rent capture</strong></td>
<td>1,25%</td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td>Economic rent capture</td>
<td>0,06%</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>Geographic rent capture</td>
<td>0,08%</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>Social-administrative rent capture</td>
<td>2,4%</td>
<td>44%</td>
<td></td>
</tr>
</tbody>
</table>

Note: The industrialization rent is the average of the import substitution rent and the technocratic rent. When only one of the two is available, it is considered as the available industrialization rent for the year. Rent capture is the sum of economic, geographic and social-administrative rent captures. When one or two of the rent captures misses for a year, only the available captures are summed up. These differences in availability...
explain that the average of global rent capture can be lower than the average of social-administrative rent capture. See appendices 4 and 6 for details on the conception of indicators. The data is considered available for a year when all the variables needed for the computation of a given indicator are available.