Giving with one hand and taking away with the other: the automobile assembly industry in Portugal (1960-1988)[1]

● Maria Luísa Sousa
Universidade Nova de Lisboa
● Maria Paula Diogo
Universidade Nova de Lisboa

Introduction

In this article on the history of the Portuguese automobile industry, we aim to analyse a less tackled issue related specifically to the assemblage process, and not to the original equipment manufacturers (OEM). In the post-war period, as automobiles became widespread, the idea of a national automobile industry became more and more attractive, even for peripheral countries, whose industrial development was embryonic. Multinational automobile manufacturers (OEMs) invested in these developing countries through direct foreign investment and grant licenses. This was a generalised practice in the second half of the twentieth century. In 1965, the trademarks of manufacturers from the seven major countries[2] were assembled in 53 countries, excluding the original ones, in 350 industrial installations; in 1981, these numbers had risen to 90 and 620 respectively.[3] In turn, the hosting (developing) countries implemented a set of economic and legal measures to ensure national participation, such as customs barriers to the free importation of complete vehicles (CBU).[4] They also encouraged the importation of completely knocked

1. The work presented here was developed from two research projects, both funded by the Portuguese Science and Technology Council: «WorTiS, Work Systems, Time and Space in the Automobile Industry» and «Development and Technology Transfer in the Portuguese Automobile Industry, (1960-1990)».
2. Great Britain, France, Western Germany, Italy, Japan, Canada and the USA.
3. Guerra (1990), p. 302.
4. Completely Built Up cars (CBU).

Fecha de recepción: enero 2011
Versión definitiva: octubre 2011

Revista de Historia Industrial
N.º 48. Año XXI. 2012.1

down (CKD) kits,[5] which were the basis for the development of the local automobile assembly sector. In a later phase, these hosting countries enforced policies for promoting exportations[6] with results which differed not only amongst countries, but also between assembly and auto components industries.[7]

However, although the automobile industry was considered by developing countries as a strategic area in economic, industrial and technical development, the efforts to create a national automobile industry were often unsuccessful.[8] The first years of the automobile industry in Portugal were based on assembly, without national original equipment manufacturers. Therefore, technological development was dependent on foreign investment. The automobile industry was created through an import substitution policy, but it did not succeed in solving the national unbalance of payments. Links were not developed with small auto components companies, and neither was the acquisition of technological skills encouraged. We argue that the main reason behind this failure was the design of the Assembly Law (1961), which clearly benefited, in a corporativist context, the commercial interests of the existing importers and not an industrial *rationale*.

As the Portuguese government had to face new European economic rules, exportation policies became more and more important. The rationalisation of the existing assembly industries became imperative (plants were either closed or reconverted) and, in 1980, the Portuguese government signed a paradigmatic contract with *Renault*, in which the two parts participated with equal shares of investment. The *Renault* Project was considered a crucial moment in the development of the auto components industry, as well as the continuity of the assembly industry in Portugal.[9] In the 1980s the number of assembly industries decreased, but both production and exportation rates increased.

In this article, we present two case studies that we believe highlight the specific characteristics of the Portuguese automobile industry, mainly con-

5. Completely Knocked Down kits (CKD) are parts, components and subsystems to vehicles' assemblage. CKD kits were to be completed according to the capacity of each national industry. Some countries even opted for the Semi-Knocked Down (SKD) version, which included some of the body parts already welded.

6. Import substitution and export promotion policies are generally associated with dependency and market theories, respectively. For an assessment of these theories see Haggard (1990).

7. Biggart and Guillén (1999).

8. Biggart and Guillén (1999). Point out five reasons why a national automobile industry was so crucial for developing countries: automobiles are expensive goods that when imported, create an outflow of money ; automobiles are important for people and goods' transportation and for military logistics ; automobile production creates vertical linkages to small auto components firms; the automobile industry creates employment and encourages technological skills; and the automobile signals the entry into the industrialised world and its manufacture is valued as a symbol of success. Ibid., p. 729.

9. Some authors defend this thesis: Féria (1999), Guerra (1990) and Simões (2000).

cerning its business strategy and technology transfer channels: *Movauto* and *Salvador Caetano – Divisão Fabril de Ovar (DFO)*. Significantly, although *Movauto* and *Salvador Caetano/DFO* were quite different, they shared the same political, economic and social environment, which modelled the way new technological skills were transferred to Portugal, namely in the fields of product conception, development and engineering.

The study is based on research in the archives of both firms, complemented by interviews with employees, who participated in the creation of the units.[10] It is an original approach, as the few existent studies on the Portuguese automobile assemblage industry rely on aggregate series of data from different types of enquires.[11] We must stress, however, that these two cases, which we believe are representative of a large segment of the assembly units during the 1960s and 1970s, do not represent the evolution of the whole motor vehicle assembly industry in Portugal. There are a few contrasting cases such as *Opel*, *Renault* and *AutoEuropa*. All three were considered key projects in the development of the Portuguese automobile industry, but only *AutoEuropa*, within the Volkswagen group, is still active.[12]

The development of the automobile industry in Portugal (1960-1988)

The Portuguese historical context

In terms of industrialisation, Portugal is clearly a latecomer.[13] A chronic low rate of qualified workers (and a low general education level), together with an incipient economic and industrial milieu, account for the peripheral Portuguese status in the contemporary world economy. At the beginning of the 20th century, Portuguese industry grew whenever the world economy moved towards recession, thus relieving national production from foreign competition: World War I, the Great Depression and World War II. In the aftermath of World War II, Portugal enjoyed a period of some prosperity, which became an important turning point for its economic policy. This new post-war strategy was marked by a clear reorientation of national economic priorities, aiming to switch from traditional agriculture to a new industrial-orienta-

10. One of the difficulties of this research was the bad shape of the companies' archives, which are not even catalogued.

11. See, for instance, Guerra (1990) and Simões (2000). For *Renault* and *AutoEuropa* cases, which are not analysed in this article, see Abreu (2004), Féria (2004), Lima et al. (1996), Lima et al. (1997), Moniz (1995), Schmidt and Almeida (1987) and Vale (1999).

12. The *Opel* project operated between 1963 and 2006. The *Renault* project lasted from 1980 until 1998. *AutoEuropa* started production in 1995 and is still functioning, although within a different business framework from the original.

13. See Mata and Valério (2003), pp. 242-246 and Aguiar and Martins (2005).

tion. Together with this strategy, a series of events accelerated the opening up of the Portuguese economy to Europe, which were catalysed by the Portuguese participation in the Marshall Plan.[14] In 1948, Portugal became a member of the Organisation for European Economic Co-operation (OEEC),[15] and was thus required to present a pluriannual economic plan.[16] In 1959, Portugal became a charter member of the European Free Trade Association (EFTA) with the other six countries of the OEEC.[17] In 1961, Portugal added its membership to the International Monetary Fund (IMF) and the World Bank and, in the following year, the General Agreement on Tariffs and Trade (GATT). In 1972, Portugal signed a commercial agreement with the European Economic Community (EEC) in order to preserve the commercial ties with Great Britain and Sweden, which had left the EFTA to join the EEC.

As mentioned above, by the time of World War II, Portuguese industrialists had taken advantage of the international crisis and imposed their industrial-oriented economic agenda. Despite strong internal opposition by conservative landowners,[18] the Portuguese secretary of industry, Ferreira Dias, a pro-industrial ideologist,[19] issued three laws that laid the foundations of the first national plan of large-scale infrastructures: in 1944, the Law of Electrification (*Lei da Electrificação*) and, in 1945, the Law for Promotion and Industrial Reorganisation and the Law of Coordination of Land Transports (*Lei do Fomento e Reorganização Industrial* e *Lei da Coordenação de Transportes Terrestres*). These laws were followed by the national Development Plans (*Planos de Fomento*), which aimed at framing the main goals of economic policy. Although the First Development Plan (1953-58) was mainly directed towards a scheme of organised public investment, it allowed former governmental initiatives, such as those promoted by Ferreira Dias, to find their own space within the national economy framework.[20] The Second Development Plan (1959-64), on the other hand, was clearly conceived to undertake industrialisation as its main goal, and, once again, Ferreira Dias was at the wheel of the Ministry

14. On the Portuguese participation in the Marshall Plan see Rollo (2007).
15. Later, in 1961, this became the Organisation for Economic Co-operation and Development (OECD).
16. Rodrigues and Mendes (1999), p. 327.
17. The adhesion to EFTA instead of the European Communities was due to the fact that Portugal could keep its scheme of imperial preference, as well as the formation of another distinct free trade zone that included Portugal and its colonies. There was also fear of adhesion to a customs union that included the most developed European economies and, finally, European Communities' political goals and the changes that this would imply in internal politics. See Mata and Valério (2003), p. 206.
18. Lisboa (1992), p. 284.
19. See Dias Júnior (1946). For an introduction to the life and work of Ferreira Dias, see Brito (1998). For industrialization during the *Estado Novo*, see Rollo (1996), Rosas (1994a) and Rosas (1994b).
20. Rollo (1996), p. 469.

of Economy (1955-62).[21] Apart from a very small group of entrepreneurs, who shared a modern approach to industry, most of the Portuguese industrial bourgeoisie did not have any experience of entrepreneurship or specific technical or commercial training. This led to an industrial growth based mostly on very low wages that was, therefore, hardly sustainable. The Third Development Plan (1968-73) was defined by a new political framework; Salazar, the architect and the leader of *Estado Novo* for about 40 years had an accident and was replaced by Marcelo Caetano, who presented himself as a more open-minded and moderate leader.[22] Caetano pursued the same economic goals, namely growth of the industrial sector, but changed the strategy by opening up the Portuguese economy to foreign investors. This marked a shift from a domestic-oriented industry to an export-oriented industry. The mentor of this new approach was Rogério Martins, an engineer who was Secretary of Industry from 1969 to 1972. However, the new strategy proved quite unsuccessful and Portugal remained far from the European patterns.

Even during the so-called «golden age,» from the 1950s to the 1970s, and despite the fact that industrialisation did gain momentum, Portuguese industry remained weak when compared to international standards.[23] The extensive state regulation led to a chronic dependence of entrepreneurs *vis-à-vis* the state. State corporatism, based on employers and union associations controlled by the state, ensured «social peace» and low workforce costs; the Law of Industrial Licensing (*Lei do Condicionamento Industrial*) required that prior authorisation from the state was mandatory for setting up or relocating an industrial plant, as well as for buying machinery to increase the capacity of an existing firm. Protectionism remained in place for both the internal and the colonial markets, in spite of its gradual opening. These political, industrial and economic mechanisms heavily controlled by the central state apparatus led to undercapitalised and sub-dimensioned companies, with rudimentary technology, unqualified workers and low levels of production and productivity. In this framework the import of technologies turned out to be, very often,

21. Ibid., p. 477.

22. Following the military dictatorship that was installed with the 1926 coup d'état, and which ended the First Portuguese Republic (1910-26), the *Estado Novo* regime was «institutionalised» with the Constitution of 1933. This «constitutionalised dictatorship» was supported by the institutions of the State corporatist regime, chiefly the single party *União Nacional* (National Union), presided over by António de Oliveira Salazar (also president of the Council of Ministers), two chambers with reduced powers (National Assembly and Corporatist Chamber), censorship and a political police. Salazar's *Estado Novo* was part of the authoritarian cycle of the 1920s in Europe – mostly military initiative with the support of authoritarian right wing parties. It was more institutionalised and with greater longevity (it fell with the Carnation Revolution of April 1974) than other European dictatorships born in the 1920s. See Pinto (2008), Schmitter (1999) and Rosas (1994a).

23. Mateus (2005), p. 125, Aguiar and Martins (2005), pp. 199-202 and Afonso and Aguiar (2005), p. 322.

unsuccessful, as the lack of technical skills and competences diminished the benefits of its use and prevented a fruitful process of appropriation.

The fall of the dictatorial regime, in 1974, led to deep changes in the Portuguese society. As far as the economy was concerned, Portugal entered a negative cycle, both because of internal causes – political instability, loss of the African colonies, nationalisation of all banking, insurance, petrol and industrial companies, wage rises – and the 1979 world oil crisis. By 1985, Portuguese industrial productivity gained, once again, momentum. The democratic regime was stabilised, most of the nationalised firms were re-privatised, private investments were encouraged and protected and Portugal joined the EEC.[24]

The emergence of the Portuguese automobile industry (1961-73)[25]

Until 1961, free importation of vehicles was allowed, and although there were some formal requests for the installation of automobile assembly units, this was not allowed under the Industrial Licensing policy, and there were no previous investments, namely through the Marshall aid,[26] in the automobile industrial sector. The Assembly Law (*Lei da Montagem*) issued in 1961, marked the launch of a new strategy concerning the national automobile industry.[27] This law fitted both the spirit of the «new industry» promoted by the industrial lobby and championed by Ferreira Dias, and the objectives of the Second Development Plan (1959-64): national industry and product growth, solving the problem of employment and improving the balance of trade by diminishing the value of imports.[28]

Although under industrial licensing policy, the automobile industry was one of the less regulated sectors, the only condition being the location of the new units, which should not be in the main two cities of Lisbon and Porto.

24. Aguiar and Martins (2005), pp. 195-196.

25. Statistical data from the annual reports of the National Association of Assembly and Manufacturing Industry of Automobile Vehicles, GNIMFVA – Grémio Nacional dos Industriais de Montagem e Fabricação de Veículos Automóveis (1965-72).

26. The Marshall aid in Portugal (the direct aid, the counterpart funds and the programme AT&P) was mostly directed at agriculture – still emphasising the rural character of the country – and at some specific industrial projects, which did not have links to the automobile sector. The automobile sector benefited from direct aid for the importation of spare parts for automobiles, which were missing because of the scarcity of products experienced during and immediately after the Second World War. This was done through the actions of the Association of Automobile and Spare Parts Importers, Agents and Sellers from Southern Portugal (Grémio dos Importadores, Agentes e Vendedores de Automóveis e Acessórios do Sul – GIAVAAS), and cost 450,000 American dollars. See Rollo (2007), pp. 351, 371. Therefore, the aid to the automobile sector was mostly directed at the commercial sector rather than the industrial one.

27. Decree (Decreto Lei) n. 44104. Diário do Governo, Série 1, n 293, 20.12.1961. This first law establishes the limits and the conditions regarding the import of vehicles of all classes, completely built up, complexly knocked down or partially assembled.

28. Guerra (1990), p. 398.

The interdiction of importing commercial vehicles became effective in June 1963 and, in December 1964, it was extended to cover passenger vehicles. From then on, it was only possible to import yearly 75 units completely built up (CBU) by international manufacturer. Above this limit, automobiles could only be imported in CKD kits, and had to be assembled locally with a national incorporation rate of 15%. This legal framework was kept unchanged until 1972, except for two items: each manufacturer from the EFTA countries gained a supplemental share of 75 CBU units (1968), and the rate of national incorporation rose to 25% from the beginning of 1969 (issued in 1967).

During the period of free importation, and despite the low level in demand, the composition of the Portuguese automobile market was very diverse. As a direct consequence of this variety of brands, the number of commercial agents rose. These agents, who gathered in a corporative association – Association of Automobile and Spare Parts Importers, Agents and Sellers from Southern Portugal (Grémio dos Importadores, Agentes e Vendedores de Automóveis e Acessórios do Sul – GIAVAAS), assumed leading positions in importation, co-ordination and technical assistance. They shaped automobile industrial policy until the mid 1970s, by systematically inhibiting its industrial potential. In fact, and as we have already mentioned, the design of the Assembly Law (1961) epitomised the victory of the commercial interests of the existing importers against an industrial-driven *rationale*.[29]

After 1963-1964, a considerable number of international brands continued to be present in Portugal, a small but, nevertheless, interesting market, mostly because of the low motorisation rate and the favourable expectations of growth in demand. Still, the Portuguese market size did not allow the creation of an assembly unit with a minimum optimum dimension.[30]

By the end of 1964, 17 companies represented more than 40 foreign brands: 9 of these 17, assembled both commercial and passenger vehicles and the other 8 only commercial vehicles. Six of these companies were subsidiary of multinational firms – Ford, General Motors (GM), Fiat, *Renault*, Citroën, and British Motor Corporation (BMC) – whilst the other 11 operated under foreign brands' licenses. Except for German companies, the international leaders that were also leaders in the Portuguese market, created subsidiary companies: four were majority controlled by foreign capital and, following the American tradition, Ford and GM's subsidiaries were 100% controlled by foreign capital.[31]

In 1968, Japanese brands entered the Portuguese market. These brands, assembled in local firms, rapidly became leaders in the passenger vehicle sec-

29. See Sousa (2005).

30. In terms of international efficiency, the production volume associated with minimum optimum dimension is 200,000 vehicles per year. Guerra (1990), p. 223.

31. Ibid., pp. 405-406.

tor. This leadership, however, did not last long because of the commercial agreement between Portugal and the EEC.[32]

The high number of assembled brands and models, as well as the absence of legal limitations on the introduction of new models, led to small batch production, small businesses unable to afford to run continuous production lines. The obvious inefficiencies associated with batch production – the equipment has to be stopped, re-configured and its output tested before the next batch can be produced – inhibited both the investment and the specialisation of the auto component industry. Moreover, automobile assemblers were not allowed to enter the auto component industry, thus preventing vertical integration, and the auto component industry itself lacked support. In this context, a sustainable automobile industry could not develop.

Local incorporation of work was characterised by a very low technological level (batteries, tyres, enamel paint, varnish), and the compulsory rate of national incorporation was complemented by the income of the assembly line: salaries, fuel or energy, oils and other products. Of course, this calculation method of the national incorporation rate introduced a significant distortion concerning the real evaluation of the weight of local work, manufactured products or expertise in the Portuguese auto component industry.[33]

The free importation of CKD kits, parts and components for repairs favoured commercial interests, but it was insufficient to sustain a more strict import policy. The Assembly Law did not achieve its goals, mainly the implementation and sustainability of the automobile industry and the decrease in imports. As the mandatory rate of local incorporation was too low and the import of CKD kits did not have to match an increase in local work incorporation, the law did not induce significant investments in assembly and auto components industries.

The second industrial law, issued in 1972, aimed at levering the integration of Portuguese economy in a worldwide context, thus responding to the opening of the Portuguese market.[34] The agreement signed with the EEC in 1972, which included the end of import restrictions in 1975, was renegotiated and the deadline altered to 1980.[35] The second industrial law engaged in a new industrial policy, based on the promotion of exports and a wider opening to foreign capital and its connections to Portuguese business groups.

32. See Machado (1999).
33. Schmidt and Almeida (1987), p. 66.
34. Decree (Decreto Lei) n. 157. Diário do Governo, Série 1, n 112, 12.05.1972. This second law establishes new limits and conditions regarding the import of vehicles of all classes, completely built up, complexly knocked down or partially assembled. It revokes some of the articles of the previous law.
35. This deadline was altered again, first to 1986, and finally to 1988.

Presented as an alternative to the first automobile industry law that did not allow profitable production batches, this new law aimed to select the existing assembling factories, by proposing their closure or reconversion. Major changes were introduced: the importation of complete vehicles (CBU) started to depend on the number of assembled vehicles in the previous year, the non assembling importer became extinct and the method for calculating the national incorporation rate was clarified.[36]

In spite of the good intentions behind it, the second automobile industry law was unable to produce the deep changes which were needed to create the right momentum, mainly due to the continuous lack of investment in the auto components industry. In fact, between 1963 and 1974 the level of imports remained almost the same, exposing the failure of the national agenda as regards the development of the national automobile industry.

From the reconversion of the Portuguese automobile assembly industries to the European market opening (1974-88)[37]

After the Carnation Revolution (April 1974), which ended the dictatorship, the Portuguese economy entered a negative cycle, mainly due to political instability, loss of the African colonies, nationalisation of all banking, insurance, petrol and industrial companies, rising wages and the 1979 world oil crisis. These general crises had a significant impact on the automobile industry, leading to a strong drop in production and the financial rupture of two thirds of the assembly industries.[38]

As far as the policy for the automobile sector was concerned, significant changes were proposed. In 1974, the government created the Council for the Automobile Sector and, in 1976, the Commission for the Automobile Sector. The opening of new units was submitted to public competition, except for the cases where the public sector retained the majority of the capital. Following an export promotion policy, the importation of CKD kits of passengers' vehicles less than two tons was restricted, and additional import quotas of CKD kits could be obtained through extra exports of other products manufactured in assembly factories or in a reconverted assembly factory, as well as through significant investments in the automobile industry.

36. The rate of national incorporation started to be calculated exclusively based on components bought for the local industry, excluding secondary materials.

37. Statistical data from the annual reports of the Portuguese Association of Automobile Trade and the Association of the Assembly Automobile Industry, ACAP/AIMA - Associação do Comércio Automóvel de Portugal and Associação dos Industriais de Montagem de Automóveis (1974-92).

38. Associação do Comércio Automóvel de Portugal and Associação dos Industriais de Montagem de Automóveis (1976), p. 38.

However, these measures were, once again, insufficient in fulfilling their goals. The process of reconverting the national assembly lines was unsuccessful and the end of protectionism did not contribute to new investments. Moreover, the return of protectionist policy led to the third industrial law for the automobile sector, in 1979, which postponed the end of protectionism until the end of 1985.[39] Portugal re-negotiated with the EEC a new protocol that partially ratified the third automobile industry law, limiting some of its items: the period of validity was reduced by one year; the CBU import quotas were raised; from the end of 1982, the percentage of CKD import quotas as a counterpart to exports was reduced to 15%; and the two parts defined a maximum number of additional CKD imports for new industrial investments.

In 1976, the Portuguese government decided to launch an international consultation process with the intention of reconverting the assembly and the auto components industries. This consultation process led to the choice of the *Renault* proposal to the detriment of Peugeot-Citroën's (1977), and the *Renault* Project was authorised by the Ministers' Council in 1980. The project aimed to produce 80,000 vehicles per year and included two extra investments in other industrial units, one a foundry and the other for production of mechanical pieces (engines, transmissions and water pumps).

The approval of the *Renault* Project marked the end of this transitional period, which achieved a balance between import substitution and export promotion policies and between the continuous postponement of the end of protectionism and the promises of liberalisation in the automobile sector.

In the beginning of the 1980s a new set of measures was implemented to promote the reconversion of the existing assembly lines and to support exports. In 1984, the government issued the fourth industrial law, postponing, once again, the liberalisation of the automobile sector until the end of 1987.[40] In an effort to increase the efficiency of national assembly lines, the fourth industrial law raised both the percentage of CKD and CBU import quotas exchangeable for exports, and the rate of local incorporation (10% for assembled passenger vehicles and 20% for the commercial vehicles). CBU commercial vehicles continued to have quota restrictions.[41]

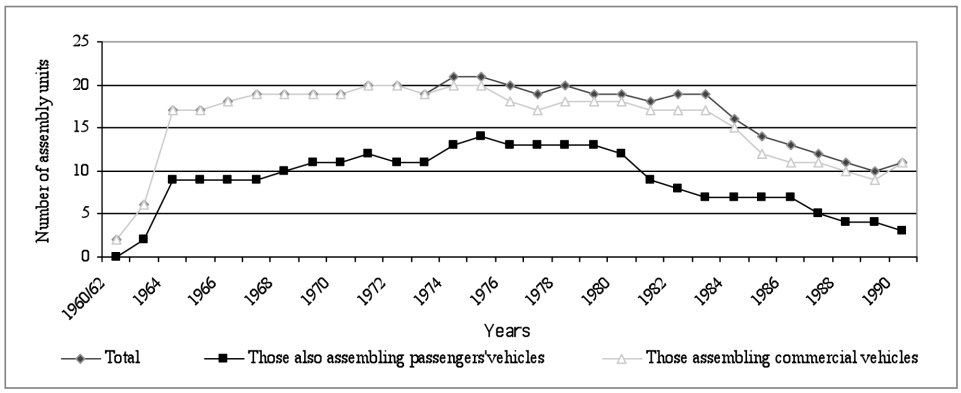
At long last, in December 1987, the import quotas of brands from EEC and EFTA countries were ended, but restrictions quotas were kept for the so-

39. Decree (Decreto-Lei) n. 351/79. Diário da República, Série 1, n 200, 30.08.1979. This third law establishes the limits and the conditions regarding the import of vehicles with commercial and industrial ends, completely built up or completely knocked down.

40. Decree (Decreto-Lei) n. 405/84. Diário da República, Série 1, n. 301, 31.12.1984. This fourth law establishes the annual import quota of vehicles with commercial and industrial ends, completely built up or completely knocked down.

41. Associação do Comércio Automóvel de Portugal and Associação dos Industriais de Montagem de Automóveis (1985), p. 27.

FIGURE 1 ▪ *Number of assembly units (1960-1990)*



Source: GNIMFVA, ACAP/AIMA (several years).

called «third countries.»[42] Hence, for Japanese brands, local assembly continued to be necessary to allow access to the Portuguese market. In this context, these assembly units could have undertaken active investment as part as their strategy to reach the EEC market through Portugal. However, due to the «origin rule»[43] the investment required for the Japanese brands to be exported as Portuguese to the EEC were too high to be a plausible even for a major manufacturer.

Project *Renault*, together with the third and the fourth automobile industry laws (1979 and 1984), were crucial to the consolidation of the export promotion policy, whose major consequences were the rationalisation of the assembly industry (reconverted or closed down) and the investment in the auto component industry.

In fact, a large number of assembly industries closed down during the 1980s. The majority of these factories assembled vehicles under license, represented European or American brands manufactured in Europe, or assembled passenger vehicles. A significant part of the firms that survived engaged in assembling exclusively commercial vehicles, a less competitive segment, with reduced scale economies and simplified assembly techniques.

42. Associação do Comércio Automóvel de Portugal and Associação dos Industriais de Montagem de Automóveis (1989), p. 38.

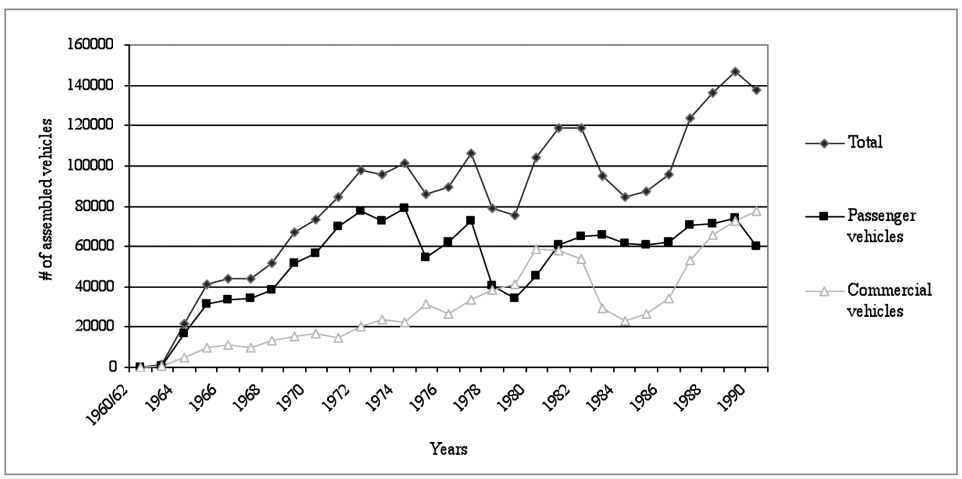
43. The «origin rule» stipulated that incorporated materials that were not manufactured in the EEC should not exceed 40% of the final production. Schmidt and Almeida (1987), p. 104.

TABLE 1 ▪ *Dimension of the assembly units (# of workers)*

		# Assembly units ordered by # of workers						
	Number of assembly units	< 100	Between 101 and 250	Between 251 and 500	> 500	Total (# of workers)	Working force (%)	# of workers by assembly unit
1966	18	10	3	2	3	3599	91.0	200
1972	20	6	5	5	4	5939	93.6	297
1975	21	-	-	-	-	6627	93.5	316
1980	19	8	1	6	4	7039	90.0	370
1985	14	5	1	5	3	4756	91.0	340
1987	12	3	2	1	6	5312	88.2	443
1990	11	2	2	3	4	5675	93.7	516

Source: GNIMFVA, ACAP/AIMA (several years).

FIGURE 2 ▪ *Volume of automobile production in Portugal (1960-1990)*



Source: GNIMFVA, ACAP/AIMA (several years).

Movauto and Salvador Caetano/DFO: two case studies[44]

Movauto was one of the assembly units created in 1962. As with most cases of licensed assemblers, *Movauto* was funded by local representatives of different brands, whose main activity was the importation of vehicles.[45] These commercial agents, with no experience in industrial activity, were forced to assemble vehicles in order to keep selling them.[46] Its purpose was to assemble commercial and passenger vehicles with grant licenses, thus responding to the imposition of local assembly of cars to accede the Portuguese market, and, as other assemblers founded in the 1960s, it had no industrial «vocation». As one of its managers stated in a letter to the Portuguese Ministry of Finance, «*Movauto* exists by force of the Decree [Decreto-Lei] no. 44104 of 20 December 1961 [the Assembly Law], to enable the automobile importers to continue to sell their vehicles. Therefore, it is not dedicated to profit gain, but only to generate its own means for survival.»[47] *Movauto*'s industrial activity lasted from 1964 until 1993, and was one of the most successful and long-lasting

44. These two case studies resulted in two unpublished reports, which were delivered to the funding institution, the Portuguese Science and Technology Council (Fundação para a Ciência e a Tecnologia): Sousa, Diogo and Carneiro (2004a); Sousa, Diogo and Carneiro (2004b). For more detail on the case studies see the reports mentioned above.

45. The three founders of *Movauto* were C. Santos, Lda., Mocar, Lda. and Moçambique Comercial, Lda., with a distribution of 40%, 40% and 20% of the stock, respectively. The first writ, which founded *Movauto* on 29 August 1962, was published in Diário do Governo, Série 3, n 218, 15.09.1962. In the sixteen writs for the changing of *Movauto*'s joint-stock, these shares evolved for a division in equal parts, i.e., one third to each of these companies or other companies associated with them. Finally, the joint-stock was divided into two equal shares between Mocar, SARL and its associates (Santomar and Gamobar) and Entreposto Comercial – Veículos e Máquinas, SA (a successor of Moçambique Comercial, Lda) and a residual share for Sociedade *Movauto* (less than 0,1%). The sixteen writs were consulted in *Movauto*'s archives and in official government publications (*Diário do Governo*). For more information see Sousa, Diogo and Carneiro (2004a), especially pp. 110-112.

46. In a document of 24/7/1962 (about two months before *Movauto*'s formal foundation) called «Bases para um contrato entre a Sociedade de Montagem e os seus clientes» (Basis for a contract between *Movauto* and its clients), the roles of the three founding associates were defined and the ending of the legal limitation on the importation of vehicles was envisioned: the terminus of the contract of exclusive assembling could occur by mutual agreement or if a new law re-installed the free importation of vehicles. It included also the definition of some principles: impartial treatment of all clients; and the client's responsibility for the investment in the factory's equipment, for the management of the orders of assembled vehicles and for the payment to the original manufacturers of the CKD kits. This basis for a contract between *Movauto* and its clients was augmented by a paragraph in 14/6/1963 regarding the limitation of the variation of the monthly orders for the assembly of vehicles. Both documents were consulted at *Movauto*'s archives. This complex geometry of relations between *Movauto*, its associates (with shares in its capital and importers of CBU and CKD) and the original equipment manufacturers such as Peugeot, Mercedes and Alfa-Romeo is also visible in the contracts between these three parties (which were consulted in *Movauto*'s archives).

47. Letter dated 21 January 1984, sent by *Movauto*'s Administrative and Finance Manager, João Piteira, to the Portuguese Minister of Finance. Letter consulted in *Movauto*'s archives.

firms exclusively based on Portuguese capital. *Movauto* assembled passenger and commercial vehicles of European, American and Japanese brands.[48] It assembled eight different brands in the same year. Against all the odds, as small batches producing many different brands imply loss of efficiency and large downtime, *Movauto* was an example of flexibility and adaptation to different setups. The *Movauto* case study exposes the failure of the Portuguese industrialisation agenda concerning the automobile industry, regardless of the protectionist legislation that inhibited the free importation of vehicles. Despite almost 30 years of protectionism, the investment framework was never consistent, neither in economic terms, nor technology and the technical training of the workers. The major investments in equipment came together with the plant installation and there was no further updating of the machinery, condemning the factory to work more than ten years with obsolete equipment.

Salvador Caetano/DFO started its industrial activity in 1971 and was created by Salvador Caetano (a firm with industrial activity since 1946).[49] It is still active today assembling commercial vehicles, representing a residual quota of the total vehicles produced in Portugal.[50] In 1968, when the Assembly Law was already in force, Salvador Caetano signed an agreement of exclusivity for the import and distribution of Toyota vehicles, which included a local plant for car assembly. Salvador Caetano met some serious difficulties in implementing his industrial plan, mostly because of the law of industrial licensing, which prevented him from enlarging the factory, thus delaying the start of production. In 1972, Toyota acquired a minority stake (27%) in Salvador Caetano's capital,[51] a unique case in the set of six factories that assembled Japanese vehicles under license in Portugal since the late 1960s. *Salvador Caetano/DFO*'s production was the assembly of CKD kits imported from Japan, with a feeble local incorporation. From a technological point of view, *Salvador Caetano/DFO* remained underdeveloped both because the production volume varied greatly and Toyota's investment never surpassed the initial minority stake.[52]

Movauto and *Salvador Caetano/DFO* had different natures, in relation to their initial vocations. *Movauto* was constituted of firms directed at vehicle imports, which maintained an ambiguous role as regards the activity of the

48. Mercedes, Peugeot, Nsu/Audi, Alfa Romeo, Unimog, UMM, Ebro (European); Jeep/Willys (American); Datsun/Nissan, Honda (Japanese).

49. See Freire (1997), Agostinho (1996) and Salvador Caetano (1966-2000).

50. See the latest data provided by the Automobile Association of Portugal (Associação Automóvel de Portugal, ACAP) on the production of automobiles in Portugal at the following link: http://www.autoinforma.pt/index.php?MIT=0&template_id=315&xpto=1&a[]= 0,36458,,, 0, (accessed 1 August 2011). *Salvador Caetano/DFO* is now *Toyota Caetano*.

51. This capital participation was accomplished by Toyota Motor Co. Ltd. and Toyota Motor Sales Co. Ltd. in equal parts of 13.5% (total of 27%). See Salvador Caetano (1972), p. 4.

52. The degree of compromise of the original manufacturer is proportional to its participation rate in the new subsidiary. See Callapez (2001).

industrial sector. *Movauto*'s major clients were its own partners, who, in turn, made the decisions concerning the activity of the factory. *Salvador Caetano/DFO*, on the other hand, started as a firm with an industrial vocation, and had by the late 1960s twenty years of industrial activity. Salvador Caetano's industrial experience was based on its former activity, the manufacture of bodies for buses (coachwork), during which he participated in several technology transfer agreements with European manufacturers and registered some patents.[53]

As already mentioned, in terms of capital structure, *Movauto* was 100% Portuguese and its relation with the original equipment manufacturers was via its commercial partners; *Salvador Caetano/DFO* had a 27% Toyota stake and established a more direct relation with Toyota. During the installation period, *Movauto*, whose owners enjoyed close ties with the political elite, had no difficulty in obtaining a government license to create an assembly unit, whilst *Salvador Caetano/DFO* had to face multiple obstacles.

In spite of the differences, *Movauto* and *Salvador Caetano/DFO* shared a common political, economic and social environment. In the context of the automobile assembly industry laws and the automobile tax regime, and having to face the changeable trends of the internal market (towards which its productions were mostly directed), both firms presented an oscillatory behaviour in their production. The industrial activity of *Movauto* and *Salvador Caetano/DFO* was based on assembly operations from CKD kits and their assembly lines were very similar. The production was based mainly on intensive manual work (body-shop, paint-shop and final assembly), leading to much lower productivity levels than those of the original equipment manufacturers, and only compensated by the low cost of the Portuguese unqualified workforce, who had no technical training.[54] During the mid 1970s crisis, both firms looked for alternative areas of production (for instance, *Movauto* assembled refrigerators[55]) to avoid redundancy,[56] and, by the beginning of the 1980s, both factories were reconverted to assemble exclusively commercial vehicles. Still, dur-

53. See Agostinho (1996) and Salvador Caetano (1966-2000).

54. The cost of the assembled vehicles from CKD kits in Portugal was generally superior to the cost of the same model imported as CBU. Guerra (1990), p. 413.

55. See Sousa, Diogo and Carneiro (2004a), pp. 58, 59. See also an internal document of *Movauto*'s archives, dated June 1983, called «Breve Notícia. A *Movauto* no passado.»

56. After the Carnation Revolution (1974), the demand for passenger vehicles, which were more expensive to construct, dropped dramatically, and the demand for commercial vehicles increased. In the specific social conditions that followed the revolution, dominated by a left wing revolutionary ideology, expensive passenger cars were perceived as «fascist cars.» Moreover, in this period the tax regime clearly favoured commercial vehicles («working cars»). See paragraph 2 of article 4 of Decree (Decreto-Lei) n. 757, Diário da República, Série 1, n. 302, 30.12.1974. The sales tax on so-called «mixed cars» was 15%, independent of their price, whereas for passenger cars it was 22% to 150%, according to their price. Barely any model paid less than 40%.

ing the 1980s, *Movauto* and *Salvador Caetano/DFO* engaged in export projects (with low success or none at all). Finally, they shared the same design concerning their assembly lines and the same type of technology transfer channels.

With respect to the assembly lines, *Movauto*'s layout was developed by Octávio Nunes de Oliveira,[57] who was the director of the factory during its twenty nine years of industrial activity. Nunes de Oliveira, a mechanical engineer, trained in Lisbon and worked as a trainee for almost two years in Mercedes' factories in Germany, during the 1950s. He used both his initial German training and the support and training of Peugeot and Mercedes' technicians (Mercedes and Peugeot were, at the time, the two most important brands assembled at *Movauto*) to project the layout. To choose the paint-shop installation, «the heart of the factory,» he visited several European factories and equipments suppliers.[58] The welding equipment for the body-shop was chosen by the same process and the welding jigs were initially provided by Mercedes and Peugeot. Later, jigs started to be manufactured in *Movauto*'s factory from manufacturers' designs, except for the Mercedes' jigs.

The purpose of assembling different brands together was the result of the association of firms that imported the very same brands and wanted to reduce costs in the assembly operation by increasing the production volume. Investments in body-shop were made whenever vehicle models changed, but always remained manual. The paint-shop was increased in 1968, when Nissan/Datsun vehicles started to be assembled, almost doubling the production, and remained without any investment until 1992, when second- hand equipment of pre-treatment and primary application was bought. The factory closed one year later.

Salvador Caetano/DFO's layout was very similar to *Movauto*'s, which was not at all coincidental. In fact, one of *Movauto*'s associate firms, C. Santos, was also an associate of another assembly unit, called *IMA,* a firm with a small participation by BMC that assembled Morris and Austin vehicles. Like *Movauto*, *IMA* started assembling vehicles in 1964 because of the Assembly Law. They were located in the same region, Setúbal (south of Lisbon), and it is clear that *Movauto* influenced *IMA*'s layout. The paint-shop equipment of both units were exactly the same as they were bought together in order to receive a discount.[59]

57. The interview with engineer Nunes de Oliveira was on 8 January 2004, after the work on *Movauto*'s archives.

58. Factories visited: Belgium, both Mercedes and Peugeot factories, where vehicles were assembled in semi-knocked down (SKD) regime; Germany, Mercedes; France, Peugeot (Sochaux); Netherlands, BMC. Equipments suppliers: England, Drysys; Germany, Krupp; France, Carrier; and Italy, Adamoli. The paint-shop was ordered from Krupp.

59. One of the founders of IMA was the firm A.M. Almeida, Lda, which was an associate of C. Santos, Lda (one of *Movauto*'s founder). The initial enrolment process in 1964 was

IMA's first director was the engineer Montenegro de Araújo, who, in 1970, was hired by Salvador Caetano to design and implement the *DFO* plant. Montenegro de Araújo became the first director of *DFO*, a position that he held until the mid 1970s. Montenegro de Araújo hired from *IMA* ten chief employees in the welding, painting, final assembly and maintenance areas to help him start the assembly operations at the *DFO* unit.[60] These men, however, brought with them old routines that severely delayed the growth of the technical sector and made the discussion of technical problems with Toyota much harder and less fruitful. Toyota technicians were present but they had very limited intervention at a micro level, mainly focusing their efforts on giving guidance and dealing with manuals. Technical discussion with Toyota remained limited until the 1980s, when *DFO* started to develop a set of local technical skills, namely welding jig designing, in order to strengthen its technical department.[61] It was not until the 1990s, however, that *DFO* began recruiting highly qualified personnel, mostly engineers, who were key actors in dialoguing with Toyota's technicians.

The similar characteristics of *Movauto* and *DFO* assembly lines were:

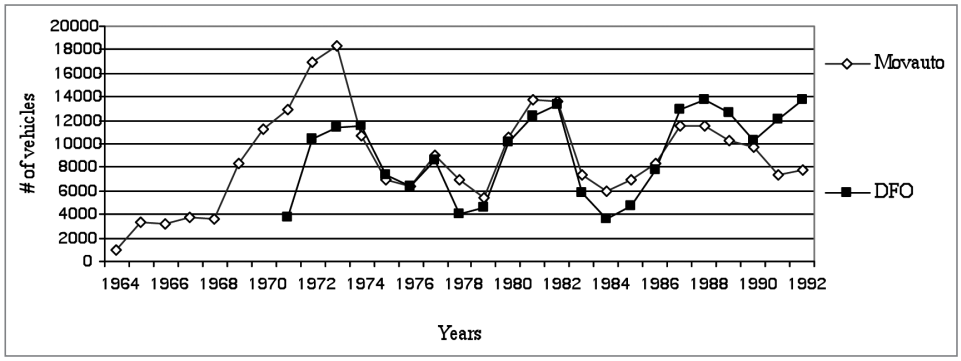
— Body-shop, paint-shop and final assembly sections were parallel, which made a «zigzag» flux. Vehicle transportation between these sections was manual.
— The assembly operations were almost completely manual, leading to the use of intensive labour force, high cycle times and low cadences. Investment in robots and/or other technologically advanced equipment was not justified by the volume of production, mainly conditioned by the feeble domestic market. Some exportation projects were put together, but they never aimed at mass production.
— The body-shop and final assembly lines were customised in order to meet conjectural needs of the assembly operations. As an example, at

done jointly, as confirmed by data available in *Movauto*'s workforce files and also by the interview with the engineer Octávio Nunes de Oliveira. Sousa, Diogo and Carneiro (2004a), pp. 16-17, 22-23.

60. We interviewed four of these ten workers in 11 June 2003: Manuel Neves Carlos, chief of the welding section; Herculano Leitão, chief of maintenance; João António Reis, chief of the painting section; and Simão Hermenegildo Prates, also chief of the painting section. As regards engineer Montenegro de Araújo's work in projecting *DFO*, we consulted two folders with documents on the negotiations of the painting equipment with the supplier, *Drysys Española, S.A.*, of 1970 and 1973. There are several letters exchanged between *Salvador Caetano*/*DFO* and *Drysys* that make apparent the role played by engineer Montenegro de Araújo in this process and in defining the original layout of the factory. See Sousa, Diogo and Carneiro (2004b), pp. 19-26.

61. This information was collected essentially through the interviews, with Alberto Silva Fernandes (on 11 and 12 June 2003) and Mário Armindo Ferreira (on 13 June 2003). Both started working in *DFO* in 1971. See ibid., pp. 30-31, 66-68.

FIGURE 3 ▪ *Passenger and commercial vehicles assembled by Movauto and DFO (1964- 1992)*



Source: *Movauto* and DFO internal documents on production data.

the beginning of the 1970s, *Movauto* assembled simultaneously eight different brands, using five body-shop lines and six final assembly lines.
— CKD kits were sent in batch to the factories. The size of these batches was one of the variables to production planning.
— The paint-shop was common to all models and brands.

In the 1980s, international manufacturers, particularly the Japanese brands, tried to establish new units in Europe in order to avoid the effects of the EEC protectionist agenda. All these new investments were characterised by the fact that they acted as exportation platforms. Portugal was clearly at a disadvantage in the Iberian context. Spain was a much larger market and a much more dynamic economy, thus becoming a powerful magnet for foreign investment. In terms of the automobile industry, the gap, which is still quite clear today,[62] goes back to the early twentieth century industrial milieu, in particular the handcrafting of top-level vehicles by *Hispano Suiza* (1904).[63] By the middle of the twentieth century, when Spain turned to mass production, there was already, in the automobile industry, a basis to work on.[64] Moreover, the autocrat-

62. According to the International Organisation of Motor Vehicle Manufacturers/Organisation Internationale des Constructeurs d'Automobiles (OICA), in 2009, Spain was the seventh biggest world producer (after Japan, USA, Germany, South Korea, Brazil and India), and the second in Europe. In 2009, Portugal was the thirteenth biggest automobile producer in the European Union and its production represented 5,8% of Spanish production. See http://www.oica.net/category/production-statistics/ (accessed 30 December 2010).

63. During the same period, the attempts to create in Spain an automobile industry directed at a lower segment, as for instance *Iberia*, failed. For discussion of the automobile industry in the early twentieth century, see Estapé-Triay (2000).

64. The importance of the early twentieth century handcrafted top-level vehicles in the rapid growth of the Spanish automobile mass production industry is consensual in Spanish historiography, although the weight of this background is still being asserted. By the 1920s, CKD

ic Spanish regime had a strong protectionist and interventionist agenda, (creating, in 1950, *SEAT* and *ENASA*, two successful national brands) that lasted until the end of the 1960s.[65] From the 1970s onwards a new strategy emerged, supporting foreign investment and promoting exportations, thus leading the Spanish automobile industry into a period of prosperity and growth. [66]

An example of this Iberian asymmetry was the Nissan project at *Movauto*, at the beginning of the 1980s.[67] This was an export-driven project, which aimed at assembling the model Nissan Pick-Up in a Portuguese/Spanish/Japanese partnership. Nissan was already one of the Motor Ibérica's major stakeholders (Barcelona factory unit) and was interested in assembling a model using European components and expertise in order to comply with the protectionist EEC rates. Although from the beginning the Portuguese participation was the less qualified, should the project have been approved, *Movauto* would have had the opportunity to upgrade its technical level. However, after about six months of negotiations, the Portuguese project was abandoned and Nissan focused fully on the Spanish alternative.

Finally, the technology transfer channels were also similar between *Movauto* and *Salvador Caetano*/*DFO*. Formal channels were restricted to license grants, assembly agreements with manufacturers, technical texts (both from manufacturers and equipment suppliers) and machinery acquisition.[68] Informal channels focused on programmed mutual visits: the manufacturers' technicians came to Portugal during the launch of new models or in technical missions; and Portuguese workers were sent abroad to the manufacturers' original factories to receive specific training.[69]

---

kits were assembled by Ford, General Motors and Fiat-Hispania in companies of joint capital, ibid., pp. 19-23. However, due to entrepreneurship, economic and organisational factors, none of these units reached mass production; Estapé-Triay (2000), pp. 24-30.

65. SEAT (Sociedad Española de Automóviles de Turismo, S.A.) was funded by the Instituto Nacional da Industria (INI), under FIAT licence and with its participation (Fiat had a 6% stake). Together with SEAT, the market leader, during the 1950s and 60s other brands were active in Spain: *Renault* (CKDs assembled and later manufactured by FASA, Fabricación de Automóviles, S.A.), Citroën Hispânia S.A., Chrysler (through Barreiros Diesel, S.A.), Automóviles de Turismo Hispano Ingleses, S.A. (AUTHISA). See García Ruiz (2001), pp. 140, 141.

66. Within this new framework, in which an association with Spanish firms was mandatory, Nissan (with Motor Ibérica), Suzuki (with Metalúrgica Santa Ana), Vokswagen (with SEAT) and IVECO/FIAT (with ENASA) entered the Spanish market. Ibid., p. 150.

67. Sousa, Diogo and Carneiro (2004a), pp. 74-79. Several documents on this project were consulted in *Movauto*'s archives and others were made available by engineer Nunes de Oliveira. Engineer Cavaco do Vale, interviewed 22 December 2003, was the factory director of *Movauto* from 1982, and travelled to Nissan in Japan in that year to be trained for this project.

68. The assembly agreements included manufactures' assistance and technical training and also the supply of special tools and handbooks. These kinds of documents were found in *Movauto*'s and *Salvador Caetano*/*DFO*'s archives. See, for instance, Sousa, Diogo and Carneiro (2004b), pp. 111, 112.

69. These visits were originally limited to the top personnel, which changed in *DFO* in the last years. Heller (1985), Daumas (1969), Staudenmaier (1989), Kuznets (1978) and Kenwood and Lougheed (1982).

As already mentioned, there was also an exchange of experiences and expertise on a more personal level. *Movauto*'s chief engineer, Octávio Nunes de Oliveira, used his experience as a trainee at the German plant of Mercedes, to project the layout of the new factory, and travelled all over Europe to collect information to support his choices concerning the unit equipment. Montenegro de Araújo, also an engineer, used his previous experience as director of *IMA* to design the *DFO* plant.

Nevertheless, informal channels had limited influence on the technical development of the Portuguese automobile industry. The reason for this semi-failure was very much related to the characteristics of the workforce itself, which was also at the core of the unsuccessful appropriation of new technical skills.

The workforce was mainly composed of young males, who were unqualified.[70] Those who had any previous experience were either non-qualified workers in the industry, or used to work as handcrafters (coopers, carpenters and upholsterers), civil construction workers, truck drivers and farmers. The majority had very low education, a maximum 6 years at school (for *Movauto*, 74,4%; for *Salvador Caetano*/*DFO*, 53,3%), and no formal technical training. Once they entered the plant, they developed their specific skills hands-on, «learning by doing and through seeing.» Only a small fraction of the labour force had high-level training (for *Movauto*, 1,7%; for *Salvador Caetano*/*DFO,* 3,1%), mostly in engineering. This very exclusive elite performed leading roles within the organisational structure of the factory and were the main beneficiaries of the training visits abroad.

Concluding remarks

Using *Movauto* and *Salvador Caetano*/*DFO* as indicative case studies, we would like to draw some general conclusions. During the 1960s, 1970s and 1980s, the Portuguese industrial agenda was strongly conditioned by successive legal frameworks (four industrial laws) that created what may seem an irrational situation: in a small domestic market, there were many small assembly units of CKD vehicles, working with a large variety of brands and models. If, theoretically, this irrationality does exist, when one looks at the specific conditions of the Portuguese industrial and commercial milieu, the choice of the automobile industry and, particularly of the automobile assembly industry, is perfectly justified.

70. The information on the workforce of *Movauto* and *Salvador Caetano*/*DFO* was collected from the workforce files consulted in their archives. For more detail on the data, see Sousa, Diogo and Carneiro (2004a), pp. 112-121 and Sousa, Diogo and Carneiro (2004b), pp. 91-111.

By the 1980s, together with the automobile sector liberalisation, by opening up to the EFTA and EEC countries, Portuguese assembly units had to face the segmentation of the European automobile industry, as well as direct competition from Spain. The expected entry of the two Iberian countries into the EEC (which took place in 1986), together with the dimension and strength of the Spanish market compared to its neighbour, led to the loss of interest of potential investors in Portugal.[71] Spain was much more attractive than Portugal, both because of the size of its market and the modern and competitive structure of its industrial sector. As an example of this low competitiveness, one may refer to the case of *Movauto*, which lost the Nissan Pick-Up project to the Barcelona unit of Motor Ibérica, S.A.

Although both countries adopted firstly a protectionist model and, later, when they entered the EEC, both tried to attract foreign investments and promote exports, the industrial path each country took was very different. Unlike Franco's protectionism, which encouraged the association of foreign and Spanish entrepreneurship and expertise, the 1961 Portuguese Assembly Law was not able to sustain the growth in the automobile sector.

The Portuguese framework was not really industry-oriented and did not point to the creation of a national brand (even with the support of an international manufacturer); its main focus was to correct the imbalance of the national payments by promoting an import substitution agenda. The Assembly Law clearly favoured commercial interests of the existing importers when compared with the interests of an industry-driven agenda. The Portuguese strategy led to the creation of a large number of small batch assembly units, unable to cope with the hard conditions of mass production. The automobile assembly industry was born in Portugal because it was the only available solution to continue to sell automobiles. This odd association between sellers and industrial entrepreneurship, which was doomed to end as soon as the automobile market was liberalised, imprinted specific characteristics on the assembly industry, namely its dispersion into small batch assembly units (assembling simultaneously several brands, with different body-shop lines, painting lines and final assembly lines) and low productivity. The concepts of scale economy, mass production and international competition were far from the Portuguese automobile assembly industry daily reality.

The weakness of the processes of technology transfer and appropriation is a result of the industrial framework just described. It is agreed that the process of integration and assimilation of innovation is closely related to the economic, political, social and cultural dynamics of the receiving area. Despite different possible geometries, a set of prerequisites is mandatory for the success of technological transfer, both concerning machinery and knowledge,

71. Guerra (1990), p. 445.

namely investment and training.[72] None of these factors were present in the Portuguese automobile assembly industry.

Regardless of successive pro-industrialist laws concerning the automobile industry, entrepreneurs did not show any appetite for innovation or any initiative to invest in changing old routines, remaining in a high level of state dependence. On the other hand, most of the workers had a very low level of education and no formal technical training. The development of their skills was based on a «learning by doing» process, which strongly conditioned their capacity to acquire new knowledge.[73] The process of transfer was limited to the handling level, that is to work in a disciplined environment where time and space matter, and the acquisition of empirical competences that support rudimentary, *bricoleur* forms of creativity (for example, the handmade fifth door in a Peugeot model assembled at *Movauto*, in 1975,[74] in order to classify the vehicle as commercial and, thus, apply for lower taxes).[75] In this context the technological transfer process entailed very little surplus both concerning the development of the automobile assembly sector and of new local technical expertise, the only gains being hands on apprenticeship.

Draped in momentary solutions, personal and political networks, and strongly marked by commercial interests that conditioned a true industrial strategy, Portuguese assembly units, during the period here analysed, were not able to develop a long-term policy concerning innovation or a plan to reach international automobile technical standards.

REFERENCES

ABREU, José Domingos Vístulo de (2004), «Indústria automóvel - projecto *Renault*», in *Momentos de Inovação e Engenharia em Portugal no Século XX. Grandes Temas*, edited by Manuel Heitor, José Maria Brandão de Brito and Maria Fernanda Rollo, Dom Quixote, Alfragide. pp. 519-527.

AFONSO, Óscar, and AGUIAR, Álvaro (2005), «A internacionalização da economia», in *História económica de Portugal, 1700-2000. O século XX*, edited by Pedro LAINS and Álvaro Ferreira da SILVA, Imprensa de Ciências Sociais, Lisboa. pp. 305-341.

AGOSTINHO, Artur (1996), *Salvador Caetano, 1946/1996. 50 Anos da Empresa*, Salvador Caetano, IMVT, SARL, Vila Nova de Gaia.

AGUIAR, Álvaro, and MARTINS, Manuel M. F. (2005), «A Indústria «, in *História*

72. Gerschenkron (1962), Rostow (1978), Rosenberg (1971), Kuznets (1974), Freeman, Clark and Soete (1982), Kenwood and Lougheed (1982) and Heller (1985).

73. Gavroglu et al. (2008).

74. Sousa, Diogo and Carneiro (2004a), p. 91. Information gathered from the interview with engineer Nunes de Oliveira.

75. See note 56 above.

económica de Portugal, 1700-2000. O século XX, edited by Pedro LAINS and Álvaro Ferreira da SILVA, Imprensa de Ciências Sociais, Lisboa. pp. 185-226.

ASSOCIAÇÃO DO COMÉRCIO AUTOMÓVEL DE PORTUGAL, and ASSOCIAÇÃO DOS INDUSTRIAIS DE MONTAGEM DE AUTOMÓVEIS (1974-92), *O Comércio e a Indústria Automóvel em Portugal*, Lisboa.

— (1976), *O Comércio e a Indústria Automóvel em Portugal*, Lisboa.

— (1985), *O Comércio e a Indústria Automóvel em Portugal*, Lisboa.

— (1989), *O Comércio e a Indústria Automóvel em Portugal*, Lisboa.

BIGGART, Nicole Woolsey, and GUILLÉN, Mauro F. (1999), «Developing Difference: Social Organization and the Rise of the Auto Industries of South Korea, Taiwan, Spain, and Argentina», *American Sociological Review*, 64, no. 5, pp. 722-747.

BRITO, José Maria Brandão de (1998), «Introdução», in *J. N. Ferreira Dias Jr., Linha de rumo I e II e outros escritos económicos: 1926-1962*, edited by José Maria Brandão de BRITO, Banco de Portugal, Lisboa, pp. IX-XXV.

CALLAPEZ, Maria Elvira (2001), *Um caso de transferência de tecnologia: a introdução em Portugal da indústria de policloreto de vinilo pela Cires*, PhD Thesis, Universidade Nova de Lisboa, Faculdade de Ciências e Tecnologia, Lisboa.

DAUMAS, Maurice (1969), «L'histoire des techniques: son objet, ses limites, ses méthodes», *Revue d'histoire des sciences et de leurs applications*, 22, no. 1, pp. 5-32.

DIAS JÚNIOR, J. N. Ferreira (1946), *Linha de rumo*, Clássica, Lisboa.

ESTAPÉ-TRIAY, Salvador (2000), «The Spanish Motor Industry in the First Third of the 20th Century: A Lost Opportunity», *Economics Working Papers of the Department of Economics and Business, Universitat Pompeu Fabra*, 470.

FÉRIA, Luis Palma (1999), *A História do Sector Automóvel em Portugal (1895-1995)*, Vol. 19, Documentos de Trabalho, GEPE - Gabinete de Estudos e Prospectiva Económica do Ministério da Economia, Lisboa.

— (2004), «*AutoEuropa* - o projecto «Ford-Volkswagen», 1989-1995», in *Momentos de Inovação e Engenharia em Portugal no Século XX. Grandes Temas*, edited by Manuel Heitor, José Maria Brandão de Brito and Maria Fernanda Rollo, Dom Quixote, Alfragide. pp. 529-539.

FREEMAN, Christopher, CLARK, John, and SOETE, Luc (1982), *Unemployment and Technical Innovation: A Study of Long Waves and Economic Development*, Frances Pinter, London.

FREIRE, Adriano (1997), «Salvador Caetano, uma história de sucesso», in *Estratégia - Sucesso em Portugal*, Verbo, Lisboa.

GARCÍA RUIZ, José Luis (2001), «La evolución de la industria automovilística española, 1946-1999: una perspectiva comparada», *Revista de Historia Industrial*, 19-20, pp. 133-163.

GAVROGLU, Kostas, PATINIOTIS, Manolis, PAPANELOPOULOU, Faidra, SIMÕES, Ana, CARNEIRO, Ana, DIOGO, Maria Paula, SÁNCHEZ, José Ramón Bertomeu, BELMAR, Antonio García, and NIETO-GALAN, Agustí (2008), «Science and tech-

nology in the European Periphery: some historiographical reflections», *History of Science*, 46, no. 152, pp. 153–175.

GERSCHENKRON, Alexander (1962), *Economic Backwardness in Historical Perspective*, Harvard University Press, Cambridge, MA.

GRÉMIO NACIONAL DOS INDUSTRIAIS DE MONTAGEM E FABRICAÇÃO DE VEÍCULOS AUTOMÓVEIS (1965-72), *Relatório, Contas, Estatísticas* Lisboa.

GUERRA, António Castro (1990), *Formas e determinantes do envolvimento externo das empresas: internacionalização da indústria automóvel e integração da indústria portuguesa na indústria automóvel mundial*, Unpublished PhD thesis, Universidade Técnica de Lisboa, Instituto Superior de Economia e Gestão, Lisbon.

HAGGARD, Stephan (1990), *Pathways from the Periphery: The Politics of Growth in the Newly Industrializing Countries*, Cornell University Press, Ithaca.

HELLER, Peter B. (1985), *Technology Transfer and Human Values – Concepts, Applications, Cases*, University Press of America, Lanham.

KENWOOD, A. George and LOUGHEED, Alan L. (1982), *Technological Diffusion and Industrialisation before 1914*, Groom Helm, London/Camberra.

KUZNETS, Simon (1974), *Economic Change: Selected Essays*, William Heinemann, London.

— (1978), «Technological innovation and economic growth», in *Technological Innovation: a Critical Review of Current Knowledge*, edited by Patrick KELLY and Melvin KRANZBERG, S. Francisco Press, S. Francisco, pp. 335-356.

LIMA, Marinús Pires de, PIRES, Maria Leonor, RODRIGUES, Maria Eugénia, and DUARTE, Teresa (1996).»A organização da indústria automóvel na península de Setúbal», *Análise Social*, 31, no. 139, pp. 1117-1182.

LIMA, Marinús Pires de, RODRIGUES, Maria Eugénia, PIRES, Maria Leonor, SILVA, Paulo, and DUARTE, Teresa (1997).»Participação e cultura em duas empresas da indústria automóvel de Setúbal», *Cadernos do Noroeste*, X, no. 2, pp. 127-152.

LISBOA, Manuel (1992).»Trabalho Caseiro e Familiar Autónomo: uma contribuição para a compreensão da política industrial do Estado Novo», *Revista Crítica de Ciências Sociais*, 34, pp. 283-298.

MACHADO, Tiago Gomes Brasão (1999), *Implicações Sócio-Organizacionais da Deslocalização de Empresas Transnacionais Japonesas na Indústria Automóvel*, MA Thesis, Instituto Superior de Economia e Gestão, Universidade Técnica de Lisboa, Lisboa.

MATA, Maria Eugénia, and VALÉRIO, Nuno (2003), *História Económica de Portugal. Uma Perspectiva Global*, Editorial Presença, Lisboa.

MATEUS, Abel (2005), «A tecnologia», in *História económica de Portugal, 1700-2000. O século XX*, edited by Pedro LAINS and Álvaro Ferreira da SILVA, Imprensa de Ciências Sociais, Lisboa, pp. 125-156.

MONIZ, António Brandão (1995).»Indústria automóvel em Portugal: tendências em evolução», *SOCIUS Working Papers*, 2/95.

PINTO, António Costa (2008), «O Estado Novo português e a vaga autoritária dos anos

1930 do século XX», In *O Corporativismo em Português. Estado, Política e Sociedade no Salazarismo e no Varguismo*, edited by António Costa PINTO and Francisco Carlos Palomanes MARTINHO, ICS. Imprensa de Ciências Sociais, Lisboa, pp. 23-49.

RODRIGUES, Manuel Ferreira, and MENDES, José Maria Amado (1999), *História da indústria portuguesa: da Idade Média aos nossos dias*, Colecção Biblioteca da História, Associação Industrial Portuense; Publicações Europa-América, Mem-Martins.

ROLLO, Maria Fernanda (1996), «A industrialização em Portugal no pós-guerra (1947-1973)», In *Dicionário de História do Estado Novo*, edited by Fernando ROSAS, José Maria Brandão de BRITO and Maria Fernanda ROLLO, Bertrand Editora, Venda Nova. pp. 465-480.

— (2007), *Portugal e a Reconstrução Económica do Pós-Guerra. O Plano Marshall e a economia portuguesa dos anos 50*, Instituto Diplomático, Ministério dos Negócios Estrangeiros, Lisboa.

ROSAS, Fernando (1994a), *O Estado Novo (1926-1974)*, Edited by José MATTOSO, Vol. VII, História de Portugal, Círculo de Leitores, Lisboa.

— (1994b), «Estado Novo e desenvolvimento económico (anos 30 e 40): uma industrialização sem reforma agrária», *Análise Social*, XXIX no. 128, pp. 871-887.

ROSENBERG, Nathan (ed.) (1971), *The Economics of Technological Change*, Penguin Books, London.

ROSTOW, Walt Whitman (1978), *The World Economy: History and Prospect*, University of Texas Press, Austin.

SALVADOR CAETANO, IMVT, SARL (1966-2000), *Relatório e Contas* Vila Nova de Gaia.

— (1972), *Relatório e Contas* Vila Nova de Gaia.

SCHMIDT, Ana, and ALMEIDA, J. Carreira (1987), *Fabricação automóvel e produção de componentes: das transformações a nível mundial ao contexto português*, Vol. 25, Estudos, Banco de Fomento Nacional, Lisboa.

SCHMITTER, Philippe C. (1999), *Portugal: do Autoritarismo à Democracia*, Imprensa de Ciências Sociais, Lisboa.

SIMÕES, Vitor Corado (2000), *Efeitos do Investimento Estrangeiro em Portugal: o Caso da Indústria Automóvel*, Lisboa.

SOUSA, M. Luísa (2005), *Uma perspectiva institucional do desenvolvimento: O caso da indústria automóvel em Portugal (1960-1990)*, MA thesis, Universidade Técnica de Lisboa, Instituto Superior de Economia e Gestão, Lisbon.

SOUSA, M. Luísa, DIOGO, Maria Paula and CARNEIRO, Ana (2004a), *Relatório do estudo de caso Movauto – Montagem de Veículos Automóveis, Lda., elaborado pela área de História de Tecnologia* Projecto WorTiS - Sistemas de trabalho, tempo e espaço na indústria automóvel, POCTI / 35275 / SOC / 2000, Monte de Caparica.

— (2004b), *Relatório do estudo de caso da Divisão Fabril de Ovar (DFO) – Salvador Caetano, IMVT, SARL, elaborado pela área de História de Tecnologia* Projecto WorTiS - Sistemas de trabalho, tempo e espaço na indústria automóvel, POCTI / 35275 / SOC / 2000, Monte de Caparica.

STAUDENMAIER, John M. (1989), *Technology's storytellers: Reweaving the human fabric*, The MIT Press, London, Cambridge.

VALE, Mário Adriano Ferreira do (1999), *Geografia da Indústria Automóvel num Contexto de Globalização. Imbricação Espacial do Sistema AutoEuropa*, PhD Thesis, Faculdade de Letras da Universidade de Lisboa, Lisboa.

■

Giving with one hand and taking away with the other: the automobile assembly industry in Portugal (1960-1988)

Abstract

The automobile industry in Portugal has its foundation in 1961, with the Assembly Law, which imposed limitations upon the importation of vehicles and created a very specific geometry of interests very much influenced by commercial interests. In order to comply with this law, manufacturers were forced either to create local affiliated companies or to concede assembly licenses to local agents. In spite of the 20 assembly plants which were built during the 1960s and 1970s, there was never a dynamic assembly sector. The capacity to absorb technology in this sector was modelled by the receptor environment, which was unable to appropriate new machinery and new skills, and remained at a handling level. The late industrialisation, the almost complete absence of engineers working in this sector and the severe lack of qualified workers made importation of technology the only available possibility. In this article we present two case studies, Movauto and Salvador Caetano/DFO, which highlight the characteristics of the Portuguese automobile industry, mainly concerning its business strategy and technology transfer channels.

Key words: Automobile; Industrialisation; Industrial Policy, International Transfer of Technology. JEL Codes: L62, O14, L52, O33.

■

Dando con una mano y quitando con la otra: la industria de montaje del automóvil en Portugal (1960-1988)

Resumen

La industria portuguesa del automóvil tiene su fundación en 1961 con la Ley de montaje, que impuso limitaciones a la importación de vehículos y creó una geometría de intereses muy específica y muy influida por los intereses comerciales. Para cumplir esta ley, los fabricantes se vieron obligados, o bien a crear compañías filiales locales, o bien a conceder licencias de montaje a agentes locales. A pesar de las veinte plantas de montaje que se construyeron durante los años 60 y 70, nunca hubo un sector de montaje dinámico. La capacidad de este sector para absorber tecnología se vio modelada por el entorno de recepción, que era incapaz de captar nueva maquinaria y nuevas destrezas, y se quedó en el nivel de manejo de materiales. La industrialización tardía, la ausencia casi completa de ingenieros que trabajaran en este sector y la grave escasez de trabajadores cualificados hicieron que importar tecnología fuera la única alternativa posible. En este artículo presentamos dos estudios de caso, Movauto y Salvador Caetano/DFO, que ilustran las características de la industria del automóvil portuguesa, sobre todo en lo que se refiere a su estrategia de negocio y a los canales de difusión de la tecnología.

Palabras clave: Automóvil, Industrialización, Política industrial, Difusión internacional de tecnología. Códigos JEL: L62, O14, L52, O33