

TRIMS, TNCS, TECHNOLOGY POLICY AND THE BRAZILIAN AUTOMOBILE INDUSTRY

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ABSTRACT

Investment in the Brazilian automobile industry boomed in the period 1995-99, benefiting from a federal scheme of incentives - *Regime Automotivo* (RA) – which was aimed at promoting export and investment. The consequent influx of green field investment and acquisitions expanded the already dominant role of TNCs in the industry. However, as a signatory of the TRIMs Agreement, Brazil had to abandon RA and related incentives from January 1 2000.

This article argues that compliance with the TRIM's Agreement does not necessarily deter TNCs from learning and innovating domestically. Brazil has achieved the accumulated endowments to sustain and raise the export competitiveness of the automobile industry. Under TRIMs, there is room for horizontal technology policies which may reveal to be effective for the promotion of exports and investment.

THE ARGUMENT

Although this is not a unique and widespread tendency, TNCs' strategies have evolved so much that countries with fairly advanced accumulated technological endowments – e.g. Brazil, India, and Singapore – enjoy a window of opportunity to strengthen their science and technology infrastructure to remain attractive. Some TNCs are increasingly relocating advanced stages of value chains in host-sites endowed with technological infrastructure, including human capital. The abundant supply of good quality, cheap engineering and technical labor has made Brazil an important target for TNCs. In addition, the rising horizontal integration tendencies of TNCs have offered the opportunity for local suppliers to integrate horizontally in component manufacturing so that both undertake integrated operations for global markets. These developments – despite being initiated by TNC strategies and global trade governance instruments – have given the room for advanced developing economies to introduce technology policies that can sustain learning and innovation. Hence, developing economies can build local

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institutions and launch technology policies to support industrial upgrading and R&D operations, which will help attract and sustain clustering activities domestically geared towards global markets.

TRANSFORMATION OF BRAZIL'S AUTOMOBILE INDUSTRY

The automobile industry has a large economic presence and consequently generates considerable political influence on the Brazilian economy. Vehicle assembly and auto-parts manufacturing together accounted for nearly 13 percent of industrial output and a quarter of manufactured exports in Brazil in 2001. Brazil's large domestic market absorbed 78 percent of the 1,8 million vehicles produced in 2001.

Cars, trucks and components have been critical to industrial growth and technological upgrading in Brazil since its promotion under the second wave of import substitution (IS) industrialization in the 50s. While TNCs have always dominated automobile, auto-parts manufacturing evolved under the ownership of TNCs and local firms – both large and small firms. Rapid growth behind protective barriers made the automobile industry a major symbol of Brazilian industrialization since the 1950s.

However, the government was faced with a dilemma in the early 1990s when economic stagnation and trade liberalization triggered its first major slowdown. Bureaucratic imports of vehicles and components and falling domestic demand cut deeply into domestic output of automobiles and components. The sudden explosion in imports severely aggravated Brazil's balance of payments. Matters got worse for domestic assemblers and component manufacturers when the Argentinian government adopted an attractive incentive scheme to promote FDI in automobile production.

The Brazilian government responded with the RA, which lasted between 1996 and 1999. The grant reduced import tariffs on vehicles, components and equipment for firms enlisted in the RA in exchange for performance targets - measured on the basis of export and investment in new or existing plants. In addition, the RA also imposed a minimum average national content of 60 percent. Import tariffs on finished vehicles was raised to 70 percent (to be phased down to 35 percent by 2000) and on auto parts was reduced to an average of 10 percent. The prime signatories to the RA were TNCs. The government sent out a clear message that Brazil is being targeted to become a production base for global markets irrespective of ownership.

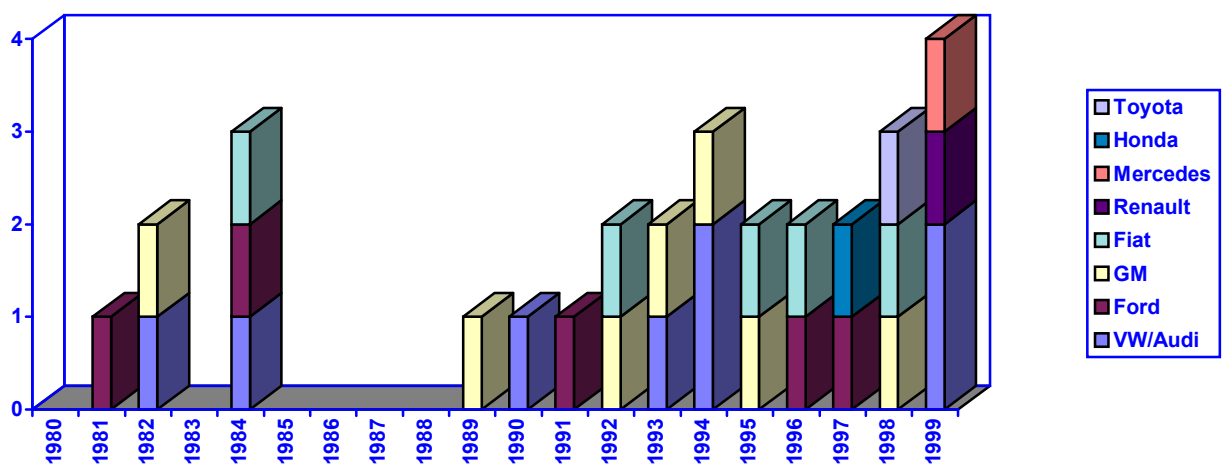
The RA helped stimulate a substantial increase in investment in the Brazilian auto-industry, which rose from US\$10bn in 1990-95 to US\$ 17bn in 1996-2000. The

investment boom changed the face of Brazil's automobile industry in the second half of the 1990s. Rapid expansion was accompanied by extensive restructuring, which helped raise productivity and competitiveness. Scale economies and technological upgrading helped narrow Brazil's technological gap –both product and process - with the more advanced economies in the automobile assembly and parts manufacturing industry.

Two major developments helped transform Brazil's automobile industry in the second half of the 1990s. First, a major surge in mergers and acquisitions transferred ownership of most large Brazilian component producers to foreign businesses. By the end of the 90s, the automobile industry had become polarized, with vehicle assembly and manufacturing of high value added components completely controlled by global TNCs and simple auto parts manufacturing dominated by a large number of Brazilian SMEs. Traditional players – e.g. Volkswagen, General Motors, Mercedes Benz, Ford and Fiat - and new entrants – e.g. Renault, Peugeot, Toyota and Honda - control all assembly activity. However, TNCs also control the higher value added segments auto parts manufacturing.

Second, the massive investment by TNCs in the late 90s helped industrial upgrading in the automobile industry. Product and process technology development (PPD) mushroomed, which has acted as a catalyst to attract new FDI in the industry as a consequence. The number of new car platforms launched in the 90s increased 400 percent, as compared to the 80s (Chart 1)

Chart 1: car platform launchings by assembler (units) - Brazil:1980/1999



Source: Quadros and Queiroz (2001)

Part of the investment under the RA was devoted to update and accelerate learning and innovation in product and process technology. The transformation in the intensity and quality of technological activities in the auto industry in Brazil can be assessed by the growth in engineering jobs, which rose from 4.000 in 1993 to 6.000 in 2001. This was remarkable given that total employment in the industry fell in the period. The assembly and the components industries together accounted for 15 percent of the manufacturing industry expenses in R&D in the late 1990s.

R&D activities in the Brazilian car industry have been concentrated in the adaptation of global platforms to local conditions and the development of related derivatives. However, new product development have characterized specific models, packages and targeted at the local market – e.g. 1000cc engines for sub-compact models, alcohol fuel engines, stronger suspension and absorbers. Moreover, some TNCs have chosen their Brazilian subsidiaries as "centers of competence" in particular technologies –e.g. Fiat involving suspension and absorbers, Mercedes Benz in natural gas engines and Mahle in engine rings. TNCs have increasingly replaced their multi-domestic approach with an integrated global approach to locate R&D activities (MEDCOFF, 1997; BARTLETT and GHOSHAL, 1998). TNC subsidiaries in Brazil have experienced the deepening of PPD activities aimed at serving the global corporation as a consequence. The development of sub-compact models by Fiat, General Motors and Volkswagen – where their Brazilian subsidiaries recently became project centers for sub-compact cars designed for developing countries – strongly follow the new approach. Yet, it is important to mention that not all subsidiaries followed the same route. Ford, for instance, an important traditional competitor has chosen to further centralise PPD in its European R&D centre.

The enlargement in PPD competency has brought major ramifications for investment and exports in Brazil. Design centers have strengthened Brazil's position in export markets – to China, Mexico, Italy and other South-American countries. Subsidiaries of General Motors and Mercedes Benz export engineering services to other subsidiaries. In addition, Brazil's emergence as a major site for these projects has given Brazilian subsidiaries decision-making powers in the selection of suppliers, which in turn has helped raise demand for local suppliers (SALERNO *et al*, 2002). Last, but not least, the accumulation of PPD capabilities and the low cost of Brazilian engineering labor have attracted more investment into new areas of R&D. Fiat has already announced plans to expand its PPD activities in Brazil over the next three years to supply the Fiat group of companies worldwide. The Brazilian automobile and components in-

dustry can be expected to experience further expansion, learning and innovations through the increased participation of TNCs. In a nutshell, the enlargement of PPD capabilities in Brazilian subsidiaries of TNCs in the auto industry is a potentially strong leveraging instrument for stimulating investment and exports.

CONCLUSIONS

This article advanced the argument that recent trade liberalizing initiatives under the WTO – including the TRIMs Agreement – has left some room for manoeuvring in economies with accumulated technological capabilities. The RA – which targeted restructuring and modernizing the Brazilian automotive chain in the late 1990s – was superseded in January 2000 as a consequence of the TRIMs Agreement. A number of factors are now seen as critical to the enhancement of the international competitiveness of the industry. The global restructuring of the automobile industry with increasing horizontal integration of segments of value chains has offered advanced developing economies such as Brazil significant learning and innovation opportunities from the enlargement of PPD activities. Although TNCs continue to dominate ownership of manufacturing assembly and the higher value added components, the deepening of such activities in Brazil and the growth in demand for local SMEs has helped stimulate investment and exports. It is clear now that the domestic market in South America is not big enough (and is very unstable) to sustain economic output scales and productivity growth using the old IS approach.

The new trading environment that is evolving, including the TRIMs Agreement, does not impede advanced developing economies like Brazil to use TNCs as important planks to access export markets more easily - particularly China, Mexico and other Asian countries. Given the significance of engineering and technical labor – both explicit and tacit – in stimulating PPD activities in TNCs, technology policy should be the basis of future industrial promotion in developing economies. Especially advanced developing economies should adopt technology policies to promote learning and innovation. Incentives and grants for education, training and R&D are compatible with the TRIMs agreement and hence should be supported to stimulate exports and investment in developing economies.

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