

Policy Paper

Driving The Dream: Morocco's Rise In The Global Automotive Industry

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Nothing better illustrates the positive contribution of the integration of national economies into global value chains than the fact that in the 1990s, the automotive sector barely existed in Morocco. Now, it is the leading export sector, with a production and assembly capacity of 700,000 vehicles, making it an attractive and competitive hub linking Africa and Europe in the automotive value chain. However, the automotive industry is on the cusp of change, with advances in electric and autonomous vehicles, and transformations in mobility, lowering the barriers to entry in car assembly, and increasing the need for labor-intensive products such as wiring harnesses.

We have identified two trends. First, vehicle manufacturers are engaging in the supply of raw materials. Second, the reorientation of investment flows and the organization of the location of production units will allow Western countries to reduce their dependence on foreign suppliers, particularly China. Upstream integration, semiconductors, clean energy, and batteries are at the center of decoupling negotiations. In an uncertain context, this research is intended to conceptualize an adaptive integration strategy for middle-income countries in global automotive value chains.

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POLICY PAPER

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INTRODUCTION

The automotive industry is one of the most structured value chains in the world. It is also the most important sector for investment in industrial research and development. The Kingdom of Morocco has managed to attract a dense network of tier 1 and tier 2 suppliers and to become an attractive and competitive platform in the automotive value chain linking Africa and Europe. As a result, the country is now Africa's leading car producer and the second-largest auto exporter to the European Union.

With an annual production capacity of 700,000 vehicles, the automotive industry is Morocco's leading export sector, with a turnover of more than \$8 billion. The sector created more than 220,000 jobs between 2014 and 2021, greatly exceeding its initial target of 90,000 jobs, which was part of the Industrial Acceleration Plan¹ in 2014. More recently, the positioning based on electric cars² and R&D are signs of a transition of the Moroccan car industry towards specialization in more advanced and complex value chains, with ESG, innovation and local integration goals.

However, the automotive global value chain (GVC) faces the semiconductor crisis and other shortages, such as critical metals used in vehicle manufacturing, and clean energy. As a result, some General Motors and Ford Motor supply lines have been temporarily shut down. Meanwhile, the German car industry has suffered from the interruption of cable harness supply caused by the war in Ukraine.

One of the weaknesses of GVCs is linked to the dependence of car manufacturers on tier 1 and 2 equipment manufacturers. Compliance with safety, social, and environmental standards is additional pressure for stakeholders in the automotive value chain³. In Morocco, the value chain remains marked by the domination of two foreign manufacturers (Renault & Stellantis), while Moroccan SMEs are poorly represented, with little capital and limited ambitions (**Amachraa and Quelin, 2022**).

This paper analyzes the challenges of developing the automotive value chain in Morocco in an uncertain and turbulent context, and explores how to improve the positioning of middle-income countries⁴ to gain a greater share of global sustainable and responsible automotive production.

1. <https://www.morocconow.com/automotives/>

2. <https://medias24.com/2022/08/06/round-up-au-maroc-lindustrie-automobile-se-prepare-au-virage-de-lelectrique/>

3. <https://www.coface.com/Economic-Studies-and-Country-Risks/Automotive>

4. <https://www.worldbank.org/en/country/mic/overview>

VI. GLOBAL VALUE CHAIN IN THE AUTOMOBILE INDUSTRY

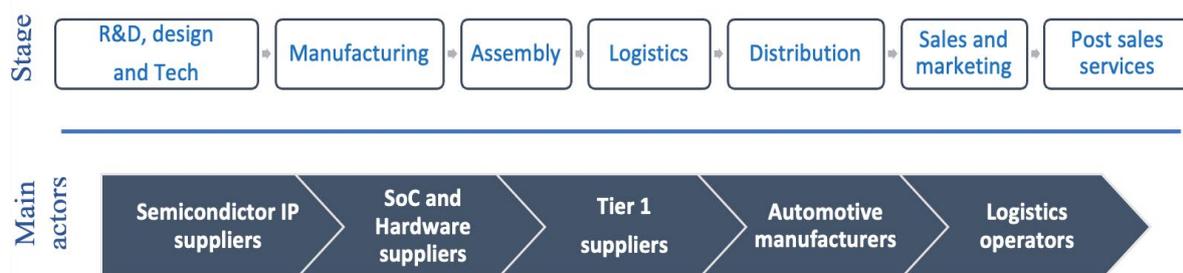
1.1 Observing Best Practices

GVCs fragment production between several key actors and territories (**Jones and Kierskowski, 2001**). Each actor specializes in a specific task. The goal is to create final value through intermediate added value (**Gereffi and Fernandez-Stark, 2016**).

Multinational enterprises drive GVCs as principals, around which are assembled layers of suppliers of different tiers and the entire chain of subcontractors required to achieve the final product (**Gereffi et al, 2005; Bair, 2008 and 2015; Ryan et al, 2022; Kano et al, 2021**).

Figure 1

Example of the Global Automotive Value Chain



Source: Author's investigation

In a context of advanced globalization and digitalization, these good practices (innovation and cooperation: **Mudambi et al, 2008; Strange and Magnan, 2018**) and these key territories are being networked globally (**Hudson, 2004; Coe & Hess, 2008; Anner, 2015; Hammer & Plugor, 2019; Coe & Yeung, 2019**). However, these GVCs have faced the pandemic and face energy crises, in addition to shortages along supply chains (**Amachraa A. Quelin B., 2022; Gereffi et al, 2022**).

The United States report, '**Building Resilient Supply Chain, Revitalizing American Manufacturing, and Fostering Broad Growth**', published in June 2021 by President Joe Biden's administration, identified five vulnerabilities in global value chains that are accelerating their reconfiguration: semiconductors, batteries, rare earths, active pharmaceutical ingredients, and large-scale utilities. In this context, the report, and another by the McKinsey Global Institute (GSI) titled '**Risk, Resilience and Rebalancing in GVCs**', suggested a series of measures and solutions including relocation of production, diversification of suppliers, the establishment of strategic stocks, risk management and adaptation capacities, redundancy of transportation networks, and reduction of product complexity.

In the case of the automotive industry, the global automotive value chain is still marked by a strong interdependence among principals and tier 1 original equipment manufacturers (OEMs). The shortage of semiconductors, complex and indispensable electronic components, is a good

example of the fragility of the automotive value chain⁵. Worldwide, the Taiwanese equipment manufacturer TSMC alone controls more than 50% of the production of electronic chips (**IDC's Worldwide Semiconductor Technology Supply Chain Intelligence study**, June 8, 2022).

Countries and MNEs involved in the development of GVCs have therefore begun processes of specialization, regionalization, and/or relocation (**Kowalski et al, 2015; Baldwin and Tomiura, 2020; Shih, 2020; Gereffi et al, 2022**), with ESG targets, because even MNEs are targeted for their social and environmental impacts (**UNCTAD, 2013; Bair and Palpacuer, 2015; ILOT, 2016; Kano et al, 2020/2021; Ashwin & Kabeer, 2020; Gereffi et al, 2021/2022; Philips et al, 2022**). Actions to relocate global value chains lead to a profound critique of GVCs (**IMF, 2022**). There appears to be an imbalance in value sharing between contractors and suppliers in the same GVC (**Mudambi et al, 2008; Porter and Kramer, 2011; Meng et al, 2020**), and a paradox between 'market' economic efficiency and 'society' vulnerabilities (Strange and Humphrey, 2019; Kano et al, 2021).

1.2 Understanding the Relationship Between Automobile Manufacturers and Suppliers

The relationships between stakeholders in the global automotive value chain reflect the fragmentation of automotive production among several countries and companies. The interdependence among manufacturers and tier 1 suppliers is the second major tendency in the automotive value chain. The semiconductor crisis mentioned earlier is a very good example. However, it is still difficult to identify the future strategies of automotive GVCs: **fragmentation** because of the effects of shortages along supply chains, or **regionalization**, i.e. a reorientation of investment flows and an organization of the location of production units to allow Western countries to reduce their degree of dependence on suppliers, particularly China. To address the heavy dependence of automotive GVCs on Asian suppliers, we have identified numerous mergers and acquisitions among manufacturers and equipment manufacturers that have formed more integrated and resilient groups (the acquisition of Magneti Marelli by the Japanese Calsonic Kansei, Siemens VDO by Continental, FTE Automotive and Peiker, Spheros, Ichikoh by the French Valeo). At the level of manufacturers, we cite the case of Stellantis, which formed a stronger group after the merger of PSA Peugeot-Citroën and Fiat Chrysler Automobiles.

The automotive industry remains marked by a period of investment in industrial R&D and electric vehicle development. The shortages along supply chains and risks to energy supplies (in terms of availability, energy being 'green' or not, and rising energy costs) mark the start of a new phase of automotive investment and cooperation between manufacturers and equipment manufacturers. Upstream integration, semiconductors and batteries are at the center of the negotiations.

In general, the relationship between automobile manufacturers and tier 1 and tier 2 suppliers depends on two key factors: (1) power asymmetries among GVC stakeholders; (2) and the degree of decoding of the information to be exchanged in the relationship (**Strange et al, 2018**). The latter includes the complexity of the information involved in manufacturing an automotive product (design and process), the ability to codify or systematize the transfer of knowledge to suppliers, and the capabilities of existing suppliers to produce the product efficiently and reliably (**Gereffi, 2005**). In this framework, automobile manufacturers often provide specifications for the production of the automotive parts and components that go into the manufacture of the final product (examples: safety-relevant parts and, more recently, anti-pollution standards). Automobile manufacturers need

5. https://www.semiconductors.org/wp-content/uploads/2021/05/BCG-x-SIA-Strengthening-the-Global-Semiconductor-Value-Chain-April-2021_1.pdf

two to three levels of suppliers to produce certain specific goods or services. So, an automobile manufacturer works with a top-tier supplier that typically has design and innovation capabilities. The top-tier supplier sources components from the second-tier suppliers and so on.

In addition to the technical and financial capacity of the tier 1 equipment manufacturer, trust is an essential determinant in the relationship between automobile manufacturers and tier 1 equipment manufacturers. To reduce the risk of bad, late or non-supply, automobile manufacturers also impose other requirements specific to supplier transactions, such as the equity and financial stability of the tier 1 supplier, the method of financing, delivery to a particular location, the use of specific ICT systems and software, or partnerships with suppliers who have already proven their know-how.

The control of MNEs also covers financial audit. However, some equipment manufacturers develop autonomous systems with exclusivity for a certain time to a manufacturer (for example, Bosch with its ABS for Mercedes, or the eight-speed gearbox that replaces the seven-speed gearbox⁶). These relationships also depend on the institutional environment and the balance sought between the return on capital injected and societal vulnerability. Thus, the integration of the automotive industry at the national level, through the participation of local SMEs, local purchasing, and job creation, has become an additional requirement for integrating an automobile ecosystem.

2. DETERMINING MOROCCO'S PLACE IN THE GLOBAL AUTOMOTIVE VALUE CHAIN

2.1 Moroccan Strategy and Organization

The automotive industry in Morocco is a success story at the global level; it testifies to a positive contribution of global value chains to the development of national economies. The Kingdom's first export sector with a production and assembly capacity of 700,000 vehicles, the automotive industry is now a new growth engine for the industrial sector and exports.

Automotive exports have climbed significantly, achieving a turnover of 83 billion dirhams in 2021 and 72 billion dirhams in 2020⁷. The automotive industry occupies a strategic position in exports, accounting for 25% of Morocco's exports in 2021, which affirms the sector's resilience during the pandemic and the conflict in Ukraine. Four-fifths of exports are destined for the EU market. France, Spain, Italy, and Germany are the main markets. At the level of the African continent, Morocco and South Africa are the leading car manufacturers. Other emerging African countries including Egypt, Ghana, Nigeria, and Algeria offer opportunities for potential automotive production, and several countries, such as Nigeria and Kenya, are already embarking on plans to develop domestic car production. In 2019, intra-African automotive exports accounted for about 16% of Africa's total automotive exports to the world. Current trends in automotive trade at the regional level highlight the opportunity to improve trade between the economic communities of West and East Africa⁸.

Despite the growth of the automobile industry, the service sector has accounted for an average of 50% of Morocco's GDP since 2008, while industry accounts for a quarter of GDP and agriculture is at most 13%. Similarly, the workforce in the industrial sector has remained stable at 1 million people and accounts for about 10% of the total workforce. Overall, the automotive sector's boom

6. https://www.mercedes-benz-bus.com/en_GB/models/oc-500-rf-euro-6/facts/equipments.html

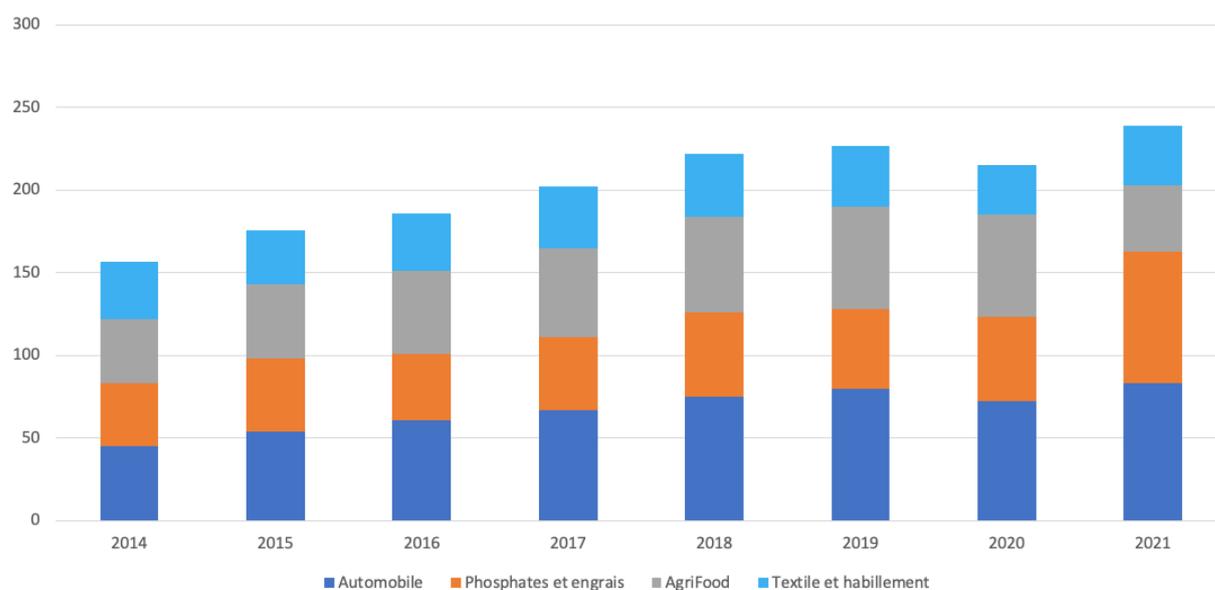
7. <https://www.oc.gov.ma/sites/default/files/2022-09/Rapport%20annuel%20du%20commerce%20ext%C3%A9rieur%202021.pdf>

8. https://unctad.org/fr/system/files/official-document/aldcafrica2019_fr.pdf

has offset the textile sector's decline, and has allowed the manufacturing industry to stabilize the workforce, increase the value of exports, and strengthen Morocco's position in global value chains.

Figure 2

Evolution of Exports from the Main Industrial Sectors in Morocco, in Billions of Dirhams



Source: Exchange office

Morocco's automotive sector is dominated by foreign companies, which focus on assembly. According to the World Bank and the Ministry of Industry and Trade (2021), the automotive GVC, with the lead companies Groupe Renault and Groupe PSA (now Stellantis), relies on more than 250 international and national suppliers that operate their own local manufacturing plants, including large companies headquartered in Germany, France, Italy, Spain, Belgium, Japan, and the United States.

For example, the American company Lear, ranked 179 on the Fortune 500 list, operates eleven production sites in Morocco to manufacture car seats and electrical systems. Chinese manufacturers have taken advantage of the opportunity of the Peugeot plant in Kenitra (North) to integrate into this value chain. Thus, the Chinese group CITIC Dicastal has built its factory in Morocco with an investment of \$400 million and a production capacity of 6 million pieces per year to supply Stellantis Group. Other examples to illustrate the dynamics and diversity of OEMs: Bosch supplies ABS and injection systems; Delphi is a specialist in injectors, HP/LP pumps and cooling systems, while Continental manufactures tires and injection systems, Valeo manufactures electronic equipment, and Novares is an OEM for plastic components. These are indeed major equipment manufacturers and are characterized by a presence in many sectors (electronics, thermal, connectors, etc.).

In Morocco, more than 95% of companies active in the automotive manufacturing sector have more than 200 employees, which shows that most players are industrial groups and EMN firms. Local players are poorly represented due to the complexity of accessing international GVCs, which requires high capacities in terms of investment and manufacturing standards. A good example is Renault Group's Dacia brand, which has local production and holds a 30% share of the local

market. It contributes positively to this trend, which was reinforced by the start of production at the Stellantis plant in 2019. The Stellantis Group is now part of a more integrated group, encompassing in addition to Peugeot and Citroën, the brands Fiat, Alfa Romeo, and Opel. This merger illustrates the dynamics of the automotive sector, with strategic mergers between automotive giants to achieve economies of scale and further reduce costs.

Figure 3

Automotive Value Chain in Morocco (non-exhaustive actors list)



The automotive value chain in Morocco is dominated by labor-intensive sub-sectors, such as seat wiring and manufacturing, on the one hand, and car assembly plants, on the other hand. In addition, a small number of companies produce spare parts, such as brake pads and filters. However, the rate of local value added is increasing. Proof of real integration in GVCs beyond a simple production base, R&D is rapidly evolving, which has materialized in the entire development of the Citroën AML electric car in Morocco, and the support for the launch of the common modular platform Stellantis CMP in Kenitra. The engine assembly began for the same project, and various parts, including lamps, steering, rims, and batteries, were integrated locally. In addition, a new model specific to Renault’s Tangier plant has been launched, which means full industrialization in Morocco, and more significant opportunities for suppliers established in the country.

After integrating labor-intensive sub-sectors in the fields of wiring and textiles for the European automotive market, Morocco continues its development by integrating car assembly and the tier 1 supplier network to cover other advanced sub-sectors including metal, plastic, and automotive glass, research and development.

2.2 Risks and Opportunities

Several factors have favored the emergence of the Kingdom in the global automotive trade. First, it seems that the long-term royal vision and the development of a modern infrastructure close to Europe (for example the port of Tangier Med and the TGV) offer a favorable and stable environment for automotive manufacturers and suppliers. The convergence between Groupe Renault-Nissan’s industrial strategies focused on developing the Dacia brand customized to the entry-level segment, and the vision of the industrial acceleration plan.

Morocco's competitiveness in the automotive sector is based primarily on the establishment of public-private partnerships (PPPs), the development of industrial and port infrastructures to international standards, the availability of a trained and low-cost workforce, and Morocco's social and political stability. This combination of factors creates an environment of trust to attract investors looking to integrate new competitive and sustainable links into their global production networks. In this context, Morocco seems to be very well positioned for the future, given its comparatively low wages, numerous public support measures for free zones (including exemption from customs duties and reduced tax rates), the availability of renewable energies, and the improvement of the logistics chain. Morocco's competitiveness is constantly improving because of the increase in volumes generated by the activity of manufacturing and assembly plants of tier 1 equipment manufacturers.

We used data extracted from OECD and UN Comtrade databases to measure Morocco's positioning, and calculated the competitive advantage of automotive products. The data reflect export values in 2019 and developments since 2015. The competitive advantage was observed for the top 10 commodities of Moroccan automotive exports in 2019. Passenger cars dominate exports. Morocco's comparative advantage improved by 35% for passenger cars, and exports reached \$3.44 billion. For auto parts, it increased by 197%, and exports reached \$324 million. Public transport vehicles achieved exports of \$29.7million and improved competitive advantage by 56%. Steering components are the most attractive products; they have gained attractiveness while the 'other parts' group has increased its attractiveness and reached a high volume. This can be explained by the opening of new production facilities for car assembly plant suppliers (the Stellantis/Peugeot plant in 2019), which has led to the expansion of the offer of products manufactured in Morocco. The largest export item is aluminum rims. With a Chinese global market leader and a Korean market leader producing in the Kingdom, Morocco has become one of the leading exporters for US and EU destinations.

Nevertheless, continued pressure on selling prices and regulation have likely led to a decline in MNE profits. They have managed this situation so far because they have achieved efficiency and quality gains ranging from 3% to 4% per year, despite stricter emissions and safety regulations adding additional costs to the average vehicle. In addition, European manufacturers support heavy investments in industrial electric vehicles R&D. Consequently, the pressure on all suppliers in global value chains to reduce the prices of their products at the next stage of the value chain will not diminish. Improving the cost structure through outsourcing and nearshoring is a constant topic in the automotive value chain, placing Morocco in the spotlight of MNEs that were not previously engaged in the MENA region. However, the rise of Asia and the relative decline of the European market in terms of the number of new cars sold, have diminished Morocco's potential to increase critical industrial mass.

In this hyper-competitive context, Morocco must have a larger workforce that has the necessary skills to develop the automotive sector. The success of the automotive cluster can serve as a promotional tool to demonstrate to students that job prospects are better with a technical or engineering degree. Therefore, it is crucial to work continuously to maintain/improve competitiveness. With low wage costs (the minimum monthly wage is €245, and the Turkish minimum wage is about double that), the many public aids to free zones (exemption from customs duties, reduced tax rates), and the improvement of the logistics chain, the country is showing constantly improving competitiveness, thanks to the increase in volumes that allows it to benefit from economies of scale. However, car manufacturers face the 'wage convergence' of developing countries. In Romania, the Renault group's Pitesti plant has been facing wage increases for several years, which have forced it to launch an automation plan. As for the Turkish plant in Bursa, it experienced several strikes in 2015 that curbed its cost base. In January 2021, autoworkers at the Stellantis plant in Kenitra in Morocco walked out and blocked their factory to demand higher wages, proper sanitary conditions, and

better working conditions. They protested against the salary (€245 basic monthly salary), poor working conditions, non-payment of bonuses and overtime, with a performance bonus that has not been paid for six months, and equipment breakdowns. The strikers received support from the CGT-PSA union in France. In addition, the start of production can lead to quality problems. These were important when the production of the Citroën AMI electric minicar started in Kenitra. However, further automation and digitization facilitate quality control at the source.

Exports to Europe must be shipped by sea, which involves loading and unloading ships, thus representing an additional cost compared to shipments of finished cars from factories located on the European continent. As to imports of parts and raw materials, logistics are vulnerable to disruptions in international supply chains, such as strikes at ports, and ship availability and prices, as shown by the recent disruptions caused by the COVID-19 pandemic and the Suez Canal incident. Furthermore, road transport in Africa for exports is threatened by the closure of the borders of neighboring states for political reasons.

Ongoing technological changes (robotization, digital, the internet of things (IoT), etc.), combined with changes in mobility linked to the ecological transition (end of combustion engines, incoming equipment manufacturers such as battery producers, etc.), will redistribute value among the actors in the sector. The displacement of value along global chains could then drastically reduce the share of value added of material production activities (and therefore the advantage of cheaper labor), and might paradoxically give back to the old industrial centers room for productivity gains. A reindustrialization of value in Europe could thus contribute to a global deindustrialization of labor, leaving few options for the economies of the South engaged in competition from below.

Car manufacturers have created competition between their different plants. The reduction of platforms (PSA wanted to reduce them from six to two) means that, for example, the assembly plants in Poissy in France, Trnava in Slovakia, and Kenitra in Morocco can build the same models. Pressure on workers, suppliers, and governments to make concessions can therefore be increased. In Morocco, some automotive suppliers in Tanger have confirmed that producers of spare parts are strongly threatened by the smuggling of Asian spare parts via Ceuta. In addition, some components, such as brake pads and clutches, will lose market because of the conversion to electric cars that do not require such parts or reduce consumption of them⁹.

The automotive industry is on the cusp of change, with advances in electric and autonomous vehicles, and transformations in mobility lowering entry barriers to assembling cars (high CAPEX for the development and production of combustion engines), and increasing the need for labor-intensive products such as wiring harnesses. International donors, such as the World Bank and the Clean Technology Fund, are working with industry and governments to invest in new technologies. The ongoing development of technology SMEs listed by Disrupt Africa¹⁰ shows the potential of SMEs to break into GVCs. As the industry moves to Industry 4.0 and adopts the segment-of-one (the trend towards mass customization), automation, robotics, and artificial intelligence, this will open up space for other innovative technologies and business models.

Morocco's automotive industrial policy aims to boost exports and employment, improve local integration and sustainability, including decarbonization. Morocco adopts a policy based on the concept of integrated industrial ecosystems aimed at increasing local content, export, and employment levels. Indeed, four poles have been structured around six industrial ecosystems to create an industry oriented towards the future of mobility: the cabling ecosystem; the metal and stamping ecosystem; the battery ecosystem; the ecosystem of vehicle interiors and seats;

9. author's survey conducted in 2021/2022

10. <https://disrupt-africa.com/funding-report/>

the drivetrain, engine, and transmission ecosystem; and the truck and industrial vehicle body ecosystem. Each ecosystem is managed in collaboration with contractors, major global equipment manufacturers, and the Moroccan Association for Automotive Industry and Trade (AMICA).

At the moment, the Ministry of Industry, in collaboration with the private sector, is strongly lobbying to attract a fourth global equipment manufacturer to help achieve the symbolic goal of one million vehicles produced per year, thereby increasing the Kingdom's industrial critical mass and competitiveness. In addition, the future EU carbon border adjustment mechanism (CBAM) represents a major opportunity to accelerate Morocco's competitiveness and access to the EU market by inserting renewable energies (RE) available in Noor (580 MW) and expected in Midelt (1600 MW). RE represents 36.8% of Morocco's total installed electricity generation capacity (10,557 MW), and is expected to reach 52% in 2030.

Since 2014, Morocco has devoted significant resources to the automotive sector. Critical supports include:

(1) Local content agreements. Renault-Nissan has signed an impressive development contract with the government, pledging to increase its volume of purchases in Morocco to €1.5 billion in 2023, from €750 million in 2016. The local integration rate is expected to increase to 65% in 2023;

(2) Protection of the local market. One of the main obstacles to scaling the African new vehicle market is the continent's dependence on second-hand car imports. Morocco allows only the import of vehicles that are less than five years old, and that comply with the European emission standard EURO4 (except for retired Moroccans returning to the country). This ban protects the local car industry from importing cheap used cars. This is a powerful policy measure considering that, for example, the sub-Saharan Africa region imported more used vehicles (764,880 units) than new vehicles (734,084 units) in 2017. Since the introduction of the limitation in 2010, the number of imported used cars has fallen from 56,000 to 13,000 (2018);

(3) Modern industrial infrastructure. Morocco has successfully managed to implement a very attractive economic megalopolis at the level of the Tanger/Al-Hoceima Region. It is an integrated offer of industrial and free zones where industrial and service activities are exempt from customs legislation and regulations, foreign trade control, and exchange control. There are three of them: one in Tanger (TFZ), and two others around the city of Kenitra: Melloussa I, totally dedicated to Renault, on 600 hectares, and Melloussa II;

(4) Port infrastructure: Tanger Med Port is located opposite Gibraltar, 14 kilometers from Spain, on the East/West global maritime trade route between Asia, Europe, and North America. The Tanger Med port is 22 kilometers from Tangier and 43 kilometers north of Tetouan. It has all the means of intermodal, road, and motorway communication directly connected to the national network via Casablanca or Rabat. Tanger Med I is backed by industrial free zones and has one of the largest container terminals in the Mediterranean, with draughts of up to 18 meters. Tanger Med II will increase the total transport capacity from 3 to 9 million TEU containers (twenty-foot equivalent unit) in 2025, and will constitute a new integrated industrial and logistics infrastructure; and

(5) Renewable energy. The increase in local value added, for example, in windshield production, metal smelting, and microelectronics, leads to industries with comparatively high-energy consumption. The government's policy of decarbonizing industry leads to high investments in renewable energies that guarantee the availability and competitiveness of energy prices (-30% target). For example, 50% of the consumption of STMicroelectronics, a company that exports 100% of its production, comes from renewable energy.

3. TO WHAT EXTENT CAN A COUNTRY POSITION ITSELF IN A GLOBAL AUTOMOTIVE VALUE CHAIN?

3.1 Last Integration Frontier

The global automotive industry continues to grow faster than any other industrial sector. Driven by markets, the automotive value chain has evolved a lot over the past 10 years: a period of unprecedented investment in industrial R&D and, more recently additional investment in supply chains and batteries, the growing role of electronic chips in automotive production, the formation of more integrated and stronger industrial groups, and the development of the electric car and clean energy. However, the crisis in semiconductors and rare metals is a significant drag on the development of global automotive production. It is one of the weaknesses of automotive GVCs linked to a heavy interdependence between MNEs and tier 1 suppliers. It should be remembered that a country like Taiwan produces more than two-thirds of the world's semiconductors. Meanwhile, China controls a large part of the production of rare metals essential for the production of batteries and renewable energy.

The automotive value chain installed in Morocco is now driven by two foreign locomotives (Renault and Stellantis), around which is articulated a dense network of tier 1 and 2 equipment manufacturers, often multinational EMNs and rarely joint ventures (JV) with Moroccan companies. As a result, local SMEs often act only in tier 3 as subcontractors, or even in tier 4.

Similarly, the lack of upstream integration capacities in the automotive sector at the national level reinforces Morocco's dependence on Asian equipment manufacturers. Moreover, there are many examples around the world of what can happen if a country becomes too dependent on one other country or a few MNEs. Therefore, foreign participation, with such a large share, in clean energy and electric vehicle infrastructure new investments would be a risky bet.

The question is, therefore, to know what Morocco wants to be sovereign. Which link in the chain to make more regional? And how to avoid that some European and Asian countries and MNEs not have a lever allowing them to exercise such enormous control over the Moroccan automotive value chain? In this turbulent context, the entire Moroccan automotive industry, whatever its link of activity, must find a good balance between competitiveness and vulnerability, which can include semiconductors but also rare metals, batteries, localized production sites, and many innovation services related to national SMEs and public services.

Morocco is a major phosphate producer and has enormous potential in the mining sector, which is an asset for developing new rare-earth extraction techniques and for installing a first iron phosphate and lithium cathode plant. However, the potential sites for extraction, processing, and battery manufacturing remain to be determined. The evaluation is complex and requires a comprehensive approach based on environmental, technological, socio-economic, strategic, and financial aspects. In 2022, British rare minerals mining specialist Rainbow Rare Earths joined forces with OCP and Mohammed VI Polytechnic University to deepen and develop the best technique for extracting rare earth elements from phosphogypsum.

Morocco has several priorities: to strengthen existing tier 1 equipment manufacturers and suppliers (tier 2 and 3), in order to make them sustainable and profitable (structuring the SME and gradually increasing the industrial mass to reach 1 million vehicles); investing, via a public-private partnership, in a new infrastructure of EV battery factories and in mining, processing, and recycling of essential metals (lithium-nickel-cobalt, lithium-iron, and phosphate); diversify partnerships, investments, and contractors involved in the global automotive value chain to reduce dependence on the two

manufacturers; strengthen the energy mix (solar wind and hydro) at the level of automotive free zones and industrial zones, provided that adequate technical solutions are put in place to arrive at a competitive price; develop innovative products for the electric, hydrogen, and e-mobility ecosystems, with the involvement of Moroccan universities and R&D (the future of the automobile is the connected car/autonomous car); and finally include the automotive industry in the great project of decarbonization and clean energy to maintain access to markets and ensure a stable supply of critical materials.

The priority, at least in the short term, should also be to target the domestic and African markets because there is a demand. EV products can be competitive there provided social stability is maintained, which is severely affected by price inflation. Therefore, investment in clean energy, semiconductors, batteries, and rare metals is a matter of national sovereignty and should take place within a sustainable and responsible regulatory framework, with continued support for local SMEs, R&D, and innovation. Indeed, suppose Moroccan SMEs can ultimately improve their contribution to automotive GVCs through innovation, increasingly efficient processes, and a qualified and creative workforce. In that case, they can thus be recognized as partners contributing more and more to the added value created. To do this, improving innovation capacity requires training, learning, and collaborations between parties. The aim is to manufacture advanced and sophisticated automotive goods locally and sustainably. In parallel, and in order to spread the social impact of global value chains, Morocco should launch (1) a national initiative to reduce inflation among the middle class, and (2) a program of social innovation and large-scale public services.

Convinced that stable and sustainable, industrial, automotive investment requires that of the territories where manufacturers and the ecosystems of tier 1 equipment manufacturers and their national and international suppliers are located, and that the overall performance of the automotive value chain is closely correlated with their performance...The MNEs have complemented their industrial actions with complementary CSR actions, the goal is to strengthen local integration and social peace. However, the commitments of the automotive value chain in purchasing and jobs have provided few benefits to the local (or regional) economy, with very few Moroccan actors integrated. MNEs create a strong expectation of employment/subcontracting that is not matched by support for local SMEs, which is still limited in scope. In addition, the CSR actions of multinational companies in local communities and their territories needs a permanent and constructive dialogue.

It needs more articulation between initiatives to promote local entrepreneurship and the markets of the automotive value chain. As a result, the sharing of value among contractors, equipment manufacturers, and local players must be at the heart of the plan to build stable and sustainable automotive production. Finally, reflection on the impact of the automotive value chain on key territories (Tangier and Kenitra in particular) and local SMEs, through the implementation of sustainable and responsible investments based on ESG, can open up a new research theme to understand better the synergies between GVCs and the development of national economies.

3.2 Four Steps

Through foreign direct investment and export promotion strategies, countries attract global value chains and specialize in creating more value domestically. Local content, job creation, and the transfer of knowledge and technology are at the heart of countries' priorities. Led by the World Bank, Taglioni and Winkler (2016) developed a strategic framework that can be used to evaluate various aspects of a country's participation in GVCs. The framework suggests "strategic issues", "approaches" to address needs and expectations, and "policy options". In this environment, access to GVCs is the primary objective of developing countries. At the front end, countries need to develop a clear road map with economic, social, and environmental goals.

To progress in global value chains, we have identified two strategies: 1) industrial upgrading, and 2) economic densification. The concept of 'upgrading' relates to gains in competitiveness, whereas 'densification' involves more local actor integration (SMEs and jobs). Next, countries chart a path of learning and growth for SMEs by specializing in complex and advanced manufacturing tasks and professional services. Countries that have achieved this objective are buyers of manufactured intermediate goods with a higher proportion of services in their domestic value added. In these countries, the quality of training, R&D, and the availability of creative skills are becoming more relevant. The last step for many buyers is to become the manufacturer of the final product by switching to high-value coordination and service tasks, such as R&D and branding.

Finally, countries will then become buyers of inputs and components, and sellers in the end markets. For the content of our research project, we have reconstructed what happened in the Morocco automotive industry to restore a plurality of viewpoints on its stages of development. We did not think in terms of 'success' or 'failure', but the idea is to show what happened while revealing the why and the how. We analyzed the structure of the value chain and then mapped the actors that appeared at key points in the process. We also analyzed the alliances of the MNEs, institutional, and local actors. Finally, we have developed a strategy to integrate middle-income countries into the global value chain, identifying enabling factors and limits.

Table 1

Four Steps in Global Value Chains

POSITION	STRATEGIC GOALS	ACTIONS
Prepare	MNE strategy	<ul style="list-style-type: none"> The global value chain integrates a group of countries and companies in the global production process. These actors are engaged in the creation of the final value added according to their competitive advantage. A multinational company drives the global value chain. MNE determines the level of control or captivity in the global value chain.
Start	Public-private partnership organization	<ul style="list-style-type: none"> Country's economy is being equipped with modern infrastructure, trains its people and increases its competitiveness. MNE negotiates and implements its investments. The country facilitates the implementation of factories, land mobilization, and talent recruitment. The country defines a first position in the GVC.
Accelerate	Specialization & green capacity	<ul style="list-style-type: none"> Government encourages the creation of integrated groups and joint ventures. The country looks to improve local integration, with social and environmental goals. Innovation proposals and country positions itself in global business services.

Fabricate	Country's emancipation	<ul style="list-style-type: none"> • Country is turning to new GVC growth drivers such as R&D, branding, and education. • Government supports the creation of public and private MNEs. • Local SMEs are a source of agility, innovation, and resilience for MNEs. A prosperous MNE needs a prosperous SMEs network. • Country has produced advanced machinery and intermediate goods locally.
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Source: Authors own

3.3 Seven Factors

However, we need seven factors to build a stable and sustainable automotive value chain.

Table 2

Automotive Integration Framework

FACTORS	CHARACTERIZATION
1. Long-term planning	<ul style="list-style-type: none"> • Government policies are expressed and pursued independently from changes in government • Institutions: centralized or fragmented; research & extension
2. Competitiveness	<ul style="list-style-type: none"> • Comparative cost of labor, green energy, logistics, finance, subsidies, custom duties for each family of final products, • Availability of a well-trained workforce.
3. Local empowerment	<ul style="list-style-type: none"> • Industry-specific network of SMEs in production, maintenance, services, and logistics to support the large industrial plants and to increase local content • Social and environmental impact
4. Risk management	<ul style="list-style-type: none"> • Investments and operations in the country are insurable risks
5. Regionalization	<ul style="list-style-type: none"> • Is there a potential to develop a regional hub in a global value chain? Or is there a threat of a negative political and/or economic development of the region?
6. Access to resources	<ul style="list-style-type: none"> • Access to raw materials and essential resources to build the electric and hydrogen vehicle (technology, cost, & sustainability)
7. Vulnerability	<ul style="list-style-type: none"> • Vulnerability is a function of the adaptive capacity of a country or industry to face the risks represented by the fragmentation of global production and the interdependence between manufacturers and tier 1 suppliers • Does the government have a strategy to adapt the industry to the impacts of fragmentation or regionalization?

Source: Authors own

3.4 Limits

For a nation to be integrated successfully into the global automotive value chain, we need also to think about some major challenges.

- Subsidies and government support must be WTO compliant.
- The market for final products must be promising enough to invest in new production capacity.
- Competition from new entrants in the e-mobility sector that do not have the main European and US brands' costs of CAPEX and of restructuring existing manufacturing and sales networks that were established over the last 70 years.
- Potential bad will created if relocation of European production capacity to Morocco is associated with loss of jobs in Europe (the bestselling and second bestselling in the EU in 2021 are made in Morocco). The currently dominating trends of allocation of capital by manufacturers, tier 1, and tier 2, groups international investors into sectors, tiers and regions. Does the engagement of manufacturers in raw material supply (for example, Renault with Managem Group on cobalt from Morocco) limit their financial capacity to invest in the development and production of cars?

CONCLUSION

Morocco has emerged successfully as a new global trader, owing primarily to its investment in infrastructure and the training of a qualified workforce. The automotive industry is the leading export sector, with a production capacity of 700 000 vehicles. However, the current transformation of the automotive industry requires huge investments, and strategic and integrated alliances. In this study, we have developed a framework of seven factors for successfully integrating a nation into the global automotive value chain. We have also identified two trends: first, the temptation for manufacturers to invest in mining to access the rare metals and critical resources needed to produce electric vehicles and hydrogen.

Second, some countries believe in investing in clean energy and adaptive infrastructure to position themselves better in an unstable and turbulent global automotive value chain. The automotive industry is on the cusp of change, with advances in electric and autonomous vehicles and transformations in mobility reducing the entry barriers to vehicle assembly (high CAPEX for the development and production of combustion engines), and increasing the need for labor-intensive products such as wiring harnesses. International donors, such as the World Bank and the Clean Technology Fund, are working with industry and governments to invest in new technologies.

The ongoing development of technology SMEs listed by Disrupt Africa shows the potential of SMEs to break into GVCs. As the industry moves to Industry 4.0 and adopts the segment-of-one (the trend towards mass customization), automation, robotics, and artificial intelligence, this will open up space for other innovative technologies and business models.

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LIST OF ABBREVIATIONS

- ESG** : Environmental, Social, & Corporate Governance - Environmental, Social and Governance Criteria
- GPN** : Global Production Networks - Global Production Networks
- GVC** : Global Value Chain - Global Value Chain
- JV** : Joint-Ventures
- MNE** : Multinational Enterprise
- OECD** : Organization for Economic Cooperation and Development
- OCP** : Cherifien Phosphates Office
- SDGs** : Sustainable Development Goals
- UN** : United Nations
- SME** : Small and medium enterprises
- R&D** : Research and development
- CSR** : Corporate Social Responsibility
- UM6P** : Mohammed VI Polytechnic University
- UNCTAD** : United Nations Conference on Trade and Development

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