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## Introduction

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Introduction

Bruno Jetin

### **1. Post-recession automobile demand: The shift from the West to emerging economies**

The global automotive industry is experiencing a great transformation. The dynamic of global automobile demand is shifting from the mature economies of the West to the emerging economies. The phenomenon is recent. In 2005, around 20 million vehicles units<sup>1</sup> were sold in Asia, Oceania, and the Middle East<sup>2</sup> as much as in North America<sup>3</sup> and more than in Europe<sup>4</sup>. That itself was already a milestone because North America and Europe used to dominate outrageously the global market with more than 70% of global vehicle sales until the end of the nineties. In 2013, Asia sold 40 million new vehicles, more than two times sales in North America (18.7 million) and Europe (14 million). It means that Europe and North America now account for only 43% of global sales less than Asia (47%)<sup>5</sup>. This is another spectacular illustration of the shift of wealth towards Asia and the advent of a multi-polar world. Of course, much of the shift owes to China rise. The Chinese automobile market is now the biggest in the world. But if we exclude China, Asia still has a market of more than 18 million units the same size as the North American market in 2013 and four million more than the European market. And if we also exclude Japan, Asia still enjoys vehicles sales of around 13 million units, about the same size as the European market. This is because many economies have emerged and now count an important middle class which buys automobiles.

This phenomenon is not confined to Asia. South America has doubled its automobile market in less than ten years from around 3 million units in 2005 up to around 6 million units in 2013. This shift to the emerging markets was boosted by the Great Recession which struck the USA and Europe in 2008-2009 and is still afflicting Europe in 2013. In 2009, vehicles sales in North America were down 6.4 million units compared to 2007, one of the biggest falls ever, and in 2013, European sales were still 4.7 million units below their 2007 level. But the same crisis had the opposite effect on the emerging economies. There was no real downturn of the automobile market in this part of the world and in 2010 vehicles sales were up 49 % in Asia and 28% in Latin America compared to their pre-recession level in 2007. In Africa too, sales were up 10 % in 2011.

Even if the mature economies recover definitely in the near future, which is far from certain due to the uncertainties lying ahead, it is hard to imagine that the emerging economies and especially China can go back to their previous state at the start of the years 2000. The shift that we are witnessing is structural. There will be of course sharp fluctuations of the automobile markets of

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<sup>1</sup> By vehicles, we consider passenger cars, light trucks and commercial vehicles. We do not focus on passenger cars only because in some countries like the USA, light trucks amount to around one half of the market. In 2013 at world level, the share of passenger cars amounted to 73% of total vehicles. Source OICA.

<sup>2</sup> Hereafter, Asia. Source: OICA, « Registrations of all types of new vehicles », updated 12 March 2014.

<sup>3</sup> North America comprises Canada, the USA and Mexico.

<sup>4</sup> Europe includes here Western, Central and Eastern Europe.

<sup>5</sup> The share of passenger cars sales in Asia is even higher. In 2013, it amounted to 51.2% of global sales.

the emerging economies and among them a hard landing of Chinese growth is a major concern. But nonetheless, there are reasons to believe that on the long-term automobile demand will be again on the rise for structural reasons. The most important one is the fact that in the emerging world, millions of consumers are still expecting to buy their first car. Although it is already the biggest automobile market of the world, in 2011 the number of vehicles per thousand inhabitants in China (69.9) was around the same level as the USA in 1919 (72.2). In Brazil, it was at the level reached by the USA in 1925; in Russia around 1947-48 and in India around 1914<sup>6</sup>. This low car density shows the huge potential for growth of the automobile market in the emerging economies providing they maintain a reasonably high long-term growth rate, shared equally among the population and green cars become affordable so that pollutant-emission is drastically curbed. This raises the issue of the distribution of national income and the impact of income inequality on vehicle sales.

## **2. The role of income distribution and inequality in automobile demand**

The relation between the level of income, income inequality and automobile demand is complex. Consumer starts buying cars when their annual income exceeds the annual cost of car ownership. In a poor country where the vast majority of the population earns less than this threshold, an increase in inequality will enable the emergence of automobile demand (Storchmann 2005). This may be the case of many African countries. If on the contrary the country is rich, and inequality starts increasing some consumers will be excluded from the automobile market. As we will see in volume one, this is the case of the USA or some European countries. So, when the level of income is low, there is a positive relation between inequality and automobile demand and when the level of income is high, the relation turns negative.

For middle-income countries there are several possibilities. For a country with a huge population and a high growth of income per capita, the increase and persistence of high income inequality is not an obstacle to the emergence of a mass automobile market and may even boost sales. This is the case of China in the nineties and the years 2000. But now that the Chinese growth rate is decelerating, a reduction of income inequality will be necessary in the future to maintain buoyant vehicle sales. At the opposite, India which has a population of the same magnitude combines a much lower household consumption per capita and lower income inequality than in China<sup>7</sup>. As a consequence, vehicle sales growth in India was about three times lower than in China. Brazil which has a comparable level of household consumption (3,587 dollars at purchasing power parity in 2005) than Russia (3,794) has a lower density of vehicles (179) than in Russia (240) because of a much higher level of inequality (Gini coefficient of 53.5 versus 39.7). On average this is also true of other Latin American countries compared to Central and Eastern European countries (Dadush and Ali 2012).

Of course, inequality is not the only factor which explains the difference in vehicle density. The population density and the degree of urbanisation are also relevant factors. Rich countries with a high density of population may suffer from congestion and people may opt for public transport when available as an alternative to vehicle ownership. Very rich and very small states and territories like

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<sup>6</sup> Source: US Department of Energy Data Book 2013, Table 3.01.

<sup>7</sup> According to the World Bank, the Gini coefficient in India in 2010 was 33.9 versus 42.1 in China. The Gini coefficient measures inequality between a range of 0 (perfect equality) and 100 (perfect inequality). In 2010, household consumption per capita in India was US\$ 599 in purchasing power parity (PPP) constant 2005 prices and US\$ 1,025 in China. Source: World Development Indicators 2014, the World Bank.

Hong Kong and Singapore are an extreme case where very high population density negatively affects vehicle ownership density, but this may also be the case of Japan and South Korea for example. At the same time cities provides more qualified and well-paid jobs than the rural space so that a country with a significant territory (not a city state) with a high degree of urbanisation may be favourable to vehicle ownership. Vast countries like the USA or Canada have a low density of population (respectively 34 and 4 persons per square kilometre) but a high level of urbanisation (around 80%). At the opposite, India has a rather high density of population (405) and a low level of urbanisation (31%). To grasp these various and contradictory effects, the number of cars per 1,000 people is regressed on household per capita in purchasing power parity in constant 2005 dollars, inequality measured by the Gini coefficient, population density and the level of urbanisation for the year 2010. The sample includes 80 countries for which homogeneous data was available. The results are shown in Table 1.

Table 1: Passenger cars ownership on household consumption per capita, Gini coefficient, population density and degree of urbanisation

Dependant variable: Number of passenger cars per 1,000 inhabitants			
Observations: 80			
R square: 0.74			
	Coefficients	Student-t	P-value
Intercept	197.54	2.9407	0.0044
Household consumption per capita	0.0119	6.9951	0.0000
Gini coefficient	-6.0317	-4.1529	0.0001
Population density	-0.0398	-3.7234	0.0004
Degree of Urbanisation	2.8488	4.0762	0.0001
Cars per 1.000 inhabitants = 197.54 + 0.0119 household consumption per capita – 6.0317 Gini coefficient - 0.0398 population density + 2.8488 degree of urbanisation			
Note: all independent variables are significant at 1 percent			
Source: World Development Indicators 2014 for all variables except Gini coefficients for OECD members.			

They show that car ownership is positively correlated with the level of household expenditure and urbanisation, and negatively correlated with inequality and population density. In other terms, even when controlling for other factors, inequality tends to lower the number of passenger cars per inhabitant. These results confirmed those of Storchmann (2005), (Ali and Dadush 2012) (Chamon et al. 2008) who have also highlighted a relationship between inequality and automobile demand.

### 3. Outline of volume 1: main trends in automobile demand in mature markets

The cross-section analysis gives only a broad picture of the factors that influence automobile demand at the global level. The objective of the book is to analyse in much deeper details the role of income distribution along with other structural factors on automobile demand in each specific national market. Other issues examined are the financing of vehicle purchase; the importance of new and used vehicles imports; the role of taxation on consumer choice and thereby on carmakers specialisation; the changes in long-term consumption pattern and the share dedicated to automobile outlays; the demographic changes and in particular the ageing of population and its impact on vehicle demand; the policies implemented by states to support the automobile industry during the

Great recession. Finally, a last contribution of the book is to assess public policies that foster the development of “green cars”. These various issues of automobile demand are analysed in the context of mature economies in volume one and in the context of emerging economies in volume 2 so that the reader may compare the common and diverging trends.

Regarding the role of income distribution, volume 1 shows how it affects the volume of new vehicle sales but also the various segments of the market and the type of vehicles. One consequence of increasing inequalities in many countries is an increasing polarisation of the product range.

At the top end of the market, there is a growing importance of expensive vehicles such as German and Japanese premium cars or American Sport-Utility Vehicles and Crossovers<sup>8</sup>. In the US case for instance, Jetin in chapter 1 shows that the rise of inequalities in the eighties was followed by the emergence of ever bigger and heavier vehicles which mimic the trend of “MacMansions” observed on the housing market. In Germany where polarisation of income has grown, (see Blöcker and Hildermeier, chapter 4), the authors found that “the higher the vehicle segment, the larger the share of commercial and institutional car holders”. Overall, in 2011 60% of all new cars were bought by these commercial and institutional holders up from 40% in 1999. This means that most new cars are not meant to be sold to private individuals who cannot afford to buy them. This is the case of many low-income earners and young people. At the other extreme, expensive cars are becoming part of the revenue package offered by companies to their highly qualified workforce. The same phenomenon is observed by Pardi in the United Kingdom (see chapter 2) where “fleet and business sales have progressively supplanted private sales as the main market for new cars”. Again, this reflects the privilege of highly paid employees whose share of national income has risen since the implementation of neoliberal policies during the Thatcher and Blair years. In France, private sales amounted to 55% in 2010 down from around 80% in the early nineties (see Jullien, chapter 3).

Another aspect of the polarisation of the product range is what Chung describes in the Korean case as a “middle squeeze” in the car segment which reflects the “middle-class squeeze”: low and top segment vehicles increase their share to the expense of the middle segment (see Chung, chapter 7). The same trend is observed in other countries by other contributors. In France, the success of Renault Dacia, the firm’s entry-level brand, is precisely due to the lower price of its models that customers can afford to pay. More than 80% of Dacia sales are to households (see Jullien, chapter 3). More, the exclusion of many wage earners from the new car market has triggered a vicious circle of excess quality described by Jullien. Instead of reducing their sale prices to match the lower purchasing capacity and willingness to pay of an increasing number of customers, carmakers tried to retain them by “accelerating sophisticated innovations to give people a sense that their products were becoming obsolete” to lure them in to buying new models. This strategy which can be successful for mobile phones which are much less onerous did not work well for cars which are much more expensive items. It led firms to increase the price of new vehicles at a time when a decrease was needed.

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<sup>8</sup> Sport-Utility Vehicles (SUV) appeared first in the eighties in the USA as a new type of light trucks. They soon became an important segment of the market and became more comfortable, powerful and luxurious. Built initially on light-truck chassis, they were later built on platforms like cars to improve their urban usage. Crossovers are the ultimate hybridisation of light-trucks and passenger cars and distinctions are getting blurred.

The difficulty to buy a new vehicle described above explains the growing importance of the secondary market, where used vehicles are sold. Buying one new vehicle per household may be affordable, but many households need one vehicle per working parent and sometimes for young adult children when public transport is deficient. In the more affluent households, one of the vehicles will be new and the other used ones. In the UK, “new cars have been mainly sold during the last twenty years to the same households that already had access to a company car for the head of the family, as their second or third car” (see Pardi, chapter 2). For the lower end of the middle class and low-income earners, all the vehicles of the household will be used ones. These structural factors have long been present in mature markets and explain why the secondary market is by far the biggest automobile market in many countries. In the USA, Jetin in chapter 1 shows that over the period 1990-2013, there were 2.7 used vehicles sold for one new. During the period of crisis like the “Great Recession”, customers try to save money on cost and the ratio exceeded three to one. The result is that prices of used cars soared, and households may not save as much as they expected. A similar pattern is observed with the same order of magnitude in other mature countries with some exception like Spain and Korea where until the Great Recession the primary market was dominant (see Köhler and Calleja Jiménez, chapter 4 and Chung, chapter 7. At the opposite, the UK has the biggest European secondary market with a long-term ratio of new to used cars exceeding three (see Pardi, chapter 2).

Another critical aspect of automobile demand is financing. In mature countries, low-interest loans have been available for a long period of time. In the USA, the average real interest rate of car loans has been decreasing since the middle of the eighties due to accommodating monetary policies from around 10% to 2%. Carmakers have sometimes used their financial arms to outmatch banks by offering zero interest rate to “push metal”, to use a popular expression. Competition between various financial actors and financial innovation has also played a role in the availability of cheap car loans. Longer loan terms and higher loan to value ratio help enlarge the automobile market to low-income earners and poor.

The flip side of this financial engineering in many countries is a growing household debt. One stellar case is the USA that Jetin (chapter 1) describes as a case “debt-driven growth regime” whereby growing debt has substituted income growth during two decades and fuelled a housing and automobile bubble until the “subprime” crisis and the Great Recession entailed a sobering return to reality. Since then, the recession has forced US households to pay away their debt which in 2013 amounted to 100% of disposable income down from around 120% in 2007. It is still a high level but it enables households to take new loans to finance automobile purchase. In Europe, two countries, Spain and the UK, stand out from the others by their much higher households’ indebtedness (respectively 140% and 170% of disposable income in 2007) versus less than 100% for France, Germany and Italy. In Spain, the reason is to be found in the role of housing construction and private consumption which were the driving force of growth before the Great Recession, much alike the USA (see chapter Köhler and Calleja Jimenez, chapter 5). The crisis hit hard Spanish households with the unemployment skyrocketing to 26% in 2013 and leaving many of them over indebted with a housing cost representing more than 40% of disposable income. In Asia, South Korea experienced the same process of indebtedness as the USA since the Asian crisis of 1997-98 but the Great Recession did not lead Korean households to deleverage. Quite the contrary, their debt has increased at a faster pace than their wage between the years 2008 and 2013 to achieve an incredibly high 160% of disposable

income in 2013. This not only constrains the future capacity to buy cars but also poses a threat to the economy (see Chung, chapter 7).

Another concern for the automobile demand in the mid and long-term is the ageing of the population of some major countries. It is especially the case of Japan, Korea and Germany which will have the highest share of people aged 60 years and over in 2050 in the world (between 40% and 45%<sup>9</sup>). At the opposite, the USA, Brazil, and Mexico will have a much lower share of old people between 20 and 30% at that time, France, the UK and China being at an intermediate level. Ageing is a critical issue for the future of automobile demand because on the one hand elder people have less mobility needs, dedicate a higher share of their income to other expenses such health and tend to replace less their old cars. In Japan, the demographic change is already present and will stay the single most important factor for the present and future development of the car market (Holger, chapter 6). According to Holger domestic car sales are already decreasing due to the demographic change. In Germany, people aged up to 39 years represented 40.6% of total registrations in 1990 but they were only 19.9% in 2010 (see Blöcker and Hildermeier, chapter 4). On the second hand, young people are less numerous and have less money to spend on automobile due to economic hardship and may prefer to spend more on other items such as communications. The various contributions of volume 1 analyse the long-term evolution of households' spending and observe that the share dedicated to automobile is shrinking while the share dedicated to communication is rising. This is especially the case among young people. This raises the issue whether there is a structural change of consumer demand away from automobile and in favour of communication services (internet and mobile phones etc...). In short is online communication a substitute at least in part to mobility? While it is tempting to answer positively, there is in fact no evidence to support this idea and it may be argued that the decrease in automobile spending reflect a short-term factor, in particular the impact of the Great Recession, and that there will be a return to the traditional pattern once the labour market improves. In many countries people still depend on automobile to work and face their basic necessities.

Finally, volume 1 describes the measures taken by the government to promote green cars. Ideally, one would expect the Great Recession to build a momentum and usher in a new era of environment-friendly cars of new forms of mobility. Electric cars in particular have raised great expectations. In mature and emerging economies, government have offered subsidised loans to innovative companies, and to electric cars buyers; they have instructed public companies to buy "green vehicles" and so forth. But the truth is that the "great push" of electric vehicles has not yet occurred for reasons that are analysed in the various chapters.

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<sup>9</sup> Source: United Nations Population Division estimates, 2012 revision.

