6 Challenges and Opportunities for the European Automotive Industry

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The current trends in automotive production suggest a shift away from large standardised fleets towards differentiated offers that follow customer tastes and needs closely. Hence, value chain operations have to follow. The importance of economies of scale in production diminishes in favour of modular flexible production techniques. Large scale production is still a major instrument in achieving cost efficiency but this does no longer apply to the complete car but to a basic platform instead. Therefore, high potential car factories are smaller and more flexible production sites that operate at the centre of an optimised supply and distribution network. This development stands in sharp contrast to the gigantic production sites of the past. The modern production facilities are designed to operate profitably at almost all levels of capacity utilisation, no matter whether these fluctuations are triggered by macroeconomic trends or changes in taste.

The changing role of suppliers has been highlighted before. They were traditionally responsible to achieve primarily cost efficiency in the automotive value chain while vehicle manufacturers focused on customer responsiveness. As suppliers move towards manufacturing whole modules the line between suppliers and manufacturers blurs, especially since suppliers also become responsible for module innovation and development. On the one hand, this development suggests increasing strategic power for the so-called first tier suppliers. Still, we doubt whether they will be able to leverage this role accordingly. Automobiles are complex products combining a vast amount of functions. Vehicle manufacturers still control the composition of this bundle. Albeit, customers buy the car, not an assembly of components and vehicle manufacturers control the prime element of this customer focus: the brand. Customers don't buy some car with a 100 hp engine, four seats and a radio, they buy a Porsche Cayenne, a VW Golf or a Renault Espace. Hence, producing larger portions of the car does not automatically qualify suppliers to design and build a whole car. The complete car is more than the sum of its parts. Hence, vehicle manufacturers will remain in the driver seat in the automotive production. They will decide what to produce and where to produce and the value chain will have to follow. While some experts predict a serious concentration among suppliers in the future, we share this vision only for a few dominant first tier suppliers. Vehicle manufacturers in the past have done an excellent job in managing complex value chains while ensuring quality. Hence, there is no immediate indication that transaction costs could be internalised by moving from a market co-ordination mechanism towards intra-organisational solutions. Additionally, the need for individualised and flexible production could open up opportunities for small, specialised suppliers which are inadequately described as

second tier suppliers since they do not bring mere screws to the table but innovative designs and technology.

Fortunately, Europe has able vehicle manufacturers and they have established a strong bond with domestic customers. These loyal customers in the largest car market in the world are a strong competitive advantage that can hardly be copied or assailed by foreign competitors. Developing and introducing a new car model requires still considerable resources (time, finances and human capital). This engagement translates into substantial risk whether the investments can be recouped by future sales. Hence, developing a new automotive product isolated from its prospective market appears to be not a feasible option. Customer feedback and interaction is necessary to yield a successful product. Therefore, the large sophisticated demand in Europe is a strong pillar of the competitive advantage of the European automotive industry. Then again, it is also true that European automotive producers need to invest abroad to generate access to tacit customer and market information to be successful in foreign markets. As long as these foreign engagements are driven by the search for knowledge and customer responsiveness abroad they make the European automotive industry stronger not weaker.

Besides, Europe has a strong position in international automotive trade. Still, most of this advantage is due to value chain re-configurations within Europe. European automotive producers achieve new potentials in efficiency by shifting production responsibilities to regions with lower costs, notably labour costs. Fortunately, after the fall of the iron curtain in Europe the new member states have emerged as great production opportunity for the European automotive industry. Especially Poland, the Czech Republic, the Slovak Republic and Hungary show the promising combination of a traditional expertise in the sector, affordable labour and the proximity to the large European markets. Although some hopes in the new member states as sales markets have not materialised yet, the engagement of the automotive industry there has turned out to be a win-win situation The changes in the production system described above facilitate such border crossing value chains. Since this value chain optimisation can be achieved within the enlarged boundaries of the European Union it is highly preferable to developments in other industries which seek comparative advantages outside of Europe. Still, those trans-European value chains need to be facilitated by an adequate infrastructure and up-to-date competencies in logistics.

6.1 A Summary of Strengths and Weaknesses, Opportunities and Threats

6.1.1 Strengths

Large home market: The EU is the largest single market for passenger cars and the second largest for commercial vehicles. It is best positioned to leverage economies of scale and scope.

Loyal European customers: European producers profit the most from positive demand factors in domestic markets since European customers predominantly prefer European brands.

Sophisticated demand: EU customers enjoy their cars beyond practical use. Many treat it as a status symbol or a hobby. Advanced feedback from loyal customers propels product quality.

Modular value chain: The value chain configuration of the European automotive industry supports flexibility and risk sharing. European producers have achieved excellence in value chain management, system standardisation and quality control.

Qualified labour: The European Automotive Industry is above all labour intensive and needs highly qualified personnel to produce highly complex, high performance, quality products. Today, the automotive products are more complex and sophisticated than ever. This implies a strong know-how base for technological innovation and a flexible labour force for organisational innovation in the value chain.

High innovation capacity: High expenditures for innovation and especially R&D in the automotive sector indicate that expectations on substantial industry dynamics in the future are high. The prominent share of the European automotive industry on these global engagements signals confidence that it will succeed in the competition for innovative products and services.

Strong position in trade: Europe holds dominant world market shares in most automotive product categories. Major indicators (revealed comparative advantages) signal that this performance can be translated in sustainable competitive potential for the future.

Responsiveness for foreign demand: The European automotive industry is highly active in leveraging knowledge, customer and market information from abroad. Those benefits can only be fully exploited by operating on site. This engagement opens up new trade opportunities for intermediate products and parts from the European home base.

Promising position in China: With China's membership in the World Trade Organisation, it is expected that the automotive industry will be one of China's largest and most powerful industries in the next twenty years. All the major car manufacturers have already established assembly plants and are still planning to build up new production capacities. The Volkswagen Group is a step ahead according to their first mover advantage.

Affordable labour in new member states: The privatisation of state-owned enterprises allowed international companies to acquire existing production plants and to employ their qualified labour force. The establishment of the automotive industry in the new member states was positively influenced by the technical labour pool. The Czech Republic for example owns 8 technical universities which establish a basis of engineers.

New member states as efficient production locations in stable European regulatory framework: New chances and possibilities arrive by the enlargement process of the EU. The 10 new member states offer a profitable production environment due to their regional labour cost and tax policy. The positive side effect is

the stable regulatory framework of the European Union which backs up investments of the automotive industry.

Road transportation as major component of value chains: Road transportation is the backbone of the European transportation system. Hence, it is deeply embedded in the value chains of almost all industries. This fact translates into investments, learning curve effects and sunk costs that generate significant barriers to entry for alternative modes of transportation and subsequently stable demand for vehicles. In addition, the demand for mobility of European citizens is steadily increasing which in turn also stimulates demand for affordable cars.

6.1.2 Weaknesses

Productivity: EU still lags behind the US and Japan in terms of labour productivity despite a significant catch-up process in the last decades. In addition, the speed of catching-up slowed in the 1990s. Also, this productivity disadvantage is not outweighed by lower labour costs. On the contrary, the catching-up with regard to labour cost compared to the US is almost complete and hourly labour costs in EU-15 are larger than in Japan and Korea.

High labour costs and inflexible labour market regulation: Modern automotive production relies on high levels of flexibility and quality. To achieve these ambitious goals highly qualified employees are a prerequisite. This manpower is expensive and automotive companies want to utilise it as productive as possible. Stringent regulative corsets through unions or the legislator make it difficult to synchronise the usage of the input factor labour with the dynamics of the automotive markets. Since other production locations catch up in educated labour forces with less regulation the European competitive position is eroding.

Knowledge loss due to forced joint ventures: In some countries, e.g. China, the automotive industry has to face the challenge of a loss of knowledge by getting market access. Some legal requirements force manufacturers to hold a minority stake of local companies. An insecure legal position concerning intellectual property rights leads not only to a knowledge loss but also to a loss of competitive advantage. The framework of FDI and IPR is being improved in the major emerging markets (e.g. China). But additional rules are being set which will especially affect decisions of internationally active supplier companies.

Slow growth in the home market: The growth of the European automotive markets has been flat in recent years compared to promising markets especially in South America and Asia. In addition some advanced automotive markets (e.g. the US in the 1990s) show more positive sales trends than EU markets. As other markets continue to grow the demand advantages from the large European market diminish over time.

Political influence on value chain decisions: Success stories in automotive production have become the synonyms for economic success in many industrialised European countries. The European Union hosts a lot of famous automotive production sites that are far more than just manufacturing locations. They have become icons of national pride. That makes it politically difficult to give up those

plants in favour of modern and more efficient facilities. Albeit, this is needed for the European automotive industry to become more competitive on a global scale. Hence, authorities that stand in the way of this process of creative destruction jeopardise the future success of the industry.

Myopic demand feedback for premium segment in the home market: While demand in the home market is a strong unassailable competitive advantage, European customers might not be the best proxy for demand in emerging markets. These growth markets might emphasise affordability and robustness over de-luxe models incorporating high-tech and comfort. Only recently EU car manufacturers start to address the challenge of mass motorisation in low income, emerging economies.

6.1.3 Opportunities

Strong position in world markets: While success in trade certainly indicates an excellence in production it does also generate valuable know-how in terms of assessing, opening and servicing foreign markets. This expertise in bridging soft skill gaps between countries (e.g. cultural differences) can hardly be obtained without actually operating in that field. Accordingly, Europe as a major player in international markets has established stable channels that constitute a competitive advantage.

Engagement in China: The Chinese automotive market is growing very rapidly. Among other things the country derives benefit from a FDI rate of about 60 billion USD a year. Market size, terms of investment and an improving infrastructure are the base for foreign automotive companies. The potential of the Chinese market does attract not only manufacturers but also the whole supplier industry.

Trend towards free trade: As the World Trade Organisation expands its membership and activities are under way for a new round of trade liberalisation, Europe as a major player in automotive trade should be among the prime beneficiaries from the opening of new markets and the intensification of existing relationships. For example China after entering the WTO is on the way to lower import tariffs and remove of non-tariff trade barriers for car imports. However, local content policies will stimulate the movement of all parts of the value chain and hence increase the danger of leaking out the knowledge of suppliers and of supply chain organisations (flexibility in production).

New technologies: The technology of fuel cells opens up a lot of opportunities for business and environment. Due to the fact that motor vehicles play a dominant role in causing air pollution manufacturers have to develop products which could address the challenge of reducing CO2 emission and increasing oil prices. In addition, European automotive firms are leading in some transitional drive train technologies which can turn out profitable before the fuel cell technology is ripe for the mass market.

6.1.4 Threats

Idiosyncratic innovation: It could be a danger for the European automotive industry that major innovations are not pushed by regulation oriented at the long-term development in the global market. Instead in some cases regulation may push innovation in dead end streets, or an inconsistent regulatory framework may hamper competitiveness. In many cases the regulation in the US, especially in California which is one of the most important markets for the industry, is one step ahead. Even the announcement of the "California Low Emission Vehicle Programme" in 1990 gave a major impulse for fuel cell research.

Regulation jeopardises value chain flexibility: While changes in taste and technology require constant re-configurations in the automotive value chain, in some countries the regulatory framework makes this task more difficult and costly. If these regulations strain predominantly domestic producers and not necessarily importing competitors they endanger the competitiveness of the European automotive sector.

Deficits in road infrastructure: Obviously, rising levels of road congestion and lacking road maintenance in combination with increasing traffic volumes make road transportation and hence vehicle demand less attractive. Additionally, the shortcomings in road transportation links make the distributed automotive production system of Europe less competitive.

Overcapacities: In recent years European, North American and Japanese markets have seen a weak development in demand. In Europe and Japan the market has been sluggish for nearly a decade. On the other hand a rapid capacity build-up in emerging Asian markets and East-European markets can be observed. Both developments may induce overcapacity in a worldwide perspective and stimulate price competition. Due to high labour costs and the lagging labour productivity EU producers are not very well equipped for price competition in the standard car segment. Together with a sluggish development in established markets this may induce additional pressures for consolidation of the industry e.g. via mergers. However, it remains to be seen whether the current slump in most established markets will continue. There are examples (e.g., UK, US in the 1990s) of revitalising established markets when the macroeconomic framework is more favourable.

Macroeconomic trend in Europe: The recent economic downturn in most of Europe has also affected the demand for automotive products. Producers have largely stimulated demand through extensive sales tactics (e.g., rebates). Still, a prolonged economic downturn at home would threaten the global competitiveness of the European automotive industry.

Groundbreaking innovations challenge existing excellence in production: The European manufacturers distinguish themselves with an excellent position in different markets. Due to the fact that R&D is getting more important and it is still the key source for new products, the threat of oversleeping groundbreaking innovations is still on the agenda. Success can breed failure, as manufacturers are in danger of being locked in traditional products and technologies and ignore revolutionising developments outside their traditional field of expertise. Some of those major breakthroughs are on the horizon in the automotive sector (e.g. the fuel

cell). They have the potential to make conventional value chain configurations obsolete and subsequently open up opportunities for new competitors.

Major innovation competition from Japanese producers: The Japanese automotive manufacturers do have a very competitive position with respect to global vehicle production. As much as three companies (Toyota, Honda and Nissan) are part of the top then manufacturers. Therefore they are a strong counterpart to the European and American companies. In some fields like hybrid engine they lead the market a long way ahead of other manufacturers.

6.2 The Forward Vision: A Scenario Approach

The previous SWOT analysis outlined the major driving forces in the competitiveness of the European automotive industry. While those items were presented separately they will obviously interact dynamically. While optimists will point towards combinations of strengths and opportunities, sceptics might stress weaknesses and threats. At first glance one would suggest to consider all possible combinations of factors. Without doubt this approach is the only true comprehensive concept. But, it is certainly not the most efficient one. Dozens of potential cases would almost certainly blur the essential information. Additionally, one could hardly assume that all factors interact at the exact same point in time. A truly comprehensive approach would therefore also have to include different time paths increasing the complexity of this concept even more. Subsequently, a more practicable framework is required.

While not all feasible combinations of future outcomes can be covered it is useful to define at least the range of possible developments. Hence, two scenarios were developed that represent borderline cases: A best and a worst case. Both try to look approximately 10 to 15 years into the future and are stimulated by the results of the prior analysis. Still they should under no circumstances be interpreted as predictions or forecasts. The real outcome will most likely lie between those two extremes. Additionally, given the time horizon there will almost certainly be new issues influencing competitiveness that have not been considered yet. Nevertheless, this scenario analysis will highlight mechanisms and dynamics that may go unnoticed otherwise. They are designed to emphasise basic mechanisms and cross dependencies with the main objective of stimulating discussions on the issue.

6.2.1 The Worst Case: Killing the Engine

While the current turbulence on the world oil markets subside over time, following 2006 oil prices do not significantly come down again and stay – inflation adjusted – at the current level or climb to new record levels. The high prices spark new investments in oil drilling and new natural resources are opened up for oil extraction that were previously deemed economically unattractive. These new

sources take time to develop and imply higher costs than traditional ones, stocks of which are limited. As a result supply on international oil markets grows slowly. On the other hand, demand explodes. In the USA conservation remains an issue of personal virtue and European demand shrinks only gradually. Hence, the largest traditional blocks of oil demand from industrialised countries remain almost unchanged. New market players especially from the growing Asian economies – notably China – move fast towards Western living standards. This includes necessarily energy consumption and mobility, which both translate into an increasing demand for oil.

Not surprisingly, significantly higher fuel prices raise car customer's interests in low consumption cars or even alternative fuel concepts. While there is a consensus that eventually hydrogen will be the fuel of the future predictions on its arrival on the mass market are shifted ten years ahead, again. Therefore, the need for a robust transitional solution arises. Given the popularity of diesel engines in Europe and the challenges of having two complete power train modes in one car as in hybrid cars, European manufacturers bet heavily on diesel. While a continued diesel boom in the European markets proofs them right, the rest of the world watches bewildered from the fences. By 2007 the US government following intense European diplomatic pressure, approves more favourable regulations on diesel fuel standards. As expected, the law stalls in congress as members of parliament consider those standards a valuable barrier to foreign competition for US carmakers whose expertise in producing diesel engines is in fact limited. The new diesel standards are signed into law by 2009. While the diesel engines have become highly efficient and meet strong environmental standards by then, US customers simply won't buy. The previous lax diesel fuel standards have severely eroded its image in the public opinion as stinking and dirty. More US customers know diesel as a jeans brand rather than a fuel. Besides, diesel infrastructure among US gas stations runs thin. Diesel is largely only available for trucks on truck gas pumps.

Recognising this shortcoming European manufacturers decide to copy tactics from telecommunications companies by subsidising diesel gas pumps in hope of selling more diesel fuelled cars. As a result, hundreds of gas stations change their setting, but not thousands. The infrastructure still appears to be frayed and peripheral. Diesel cars remain a niche product in northern America. US manufacturers license hybrid technology from Japanese competitors which reduces petrol consumption without shifting towards diesel. The deep gap between demand in the home market and their largest export market makes it difficult for European manufacturers to realise economies of scale. A few extend their relatively autonomous operations in the NAFTA region but they can't compete on size and hence costs. Meanwhile, Japanese manufacturers benefit heavily from this development since they moved early in the hybrid technology and can offer market ready technology right when customers ask for it. Royalty incomes from licenses in the US market combined with a strong diesel expertise for the European market make them the dominant player. European hopes of exporting the diesel trend to China fade, too, as Chinese officials advocate hybrid technology because of the learning effects when the hydrogen engine eventually arrives and because of environmental con-

cerns in congested cities where hybrid engines pose an advantage. By 2015 European manufacturers have lost their position in world trade and focus primarily on the home market.

The large hopes European manufacturers had in the Chinese market evaporate. In accordance with previous statements the Chinese producers turn to automotive exporters by 2007. On the back of the large and steadily growing home market and without a viable alternative due to massive overcapacities and sunk investments, China becomes the world's third largest automotive exporter by 2010. By then Chinese manufacturers have emerged as highly productive producers who excel in absorbing foreign expertise from the various joint ventures with foreign producers. In an orchestrated effort Chinese producers transfer know-how and competitive resources out of the joint ventures into companies which are completely under Chinese control. Especially through the neglect of enforcing international intellectual property laws and some subtle measures of official interference in company decisions the joint venture operations loose ground on the market place. An only superficially rooted brand awareness among Chinese customers and a broad "Buy Chinese" ad campaign accelerate the process. While most trade tariffs are gone by now, non-tariff trade barriers, like special Chinese standards and regulations, make it difficult to serve the huge market through exports. The European Commission brings the case before the World Trade Organisation. In a headline making decision the WTO rules in favour of the European Union and authorises severe countervailing measures, 4 years later. Unfortunately, the global automotive value chains have moved on during that time span and the European Union settles the case with China in an agreement that gives other industries better protection from the same fate. As a result, the European automotive producers were not able to generate a large export market for themselves. To the contrary, low price imports from China are now threatening their home market and export markets in Eastern Europe.

On the production side European producers find it also difficult to compete. Innovation intensity and investment remains strong but most of these activities are spurred by regulatory requirements not by the market. Accordingly, they generate costs but rarely sales. Design – the traditional mainstay of European cars – is now not only limited by the dominant platform production concept but also by regulatory requirements that limit the freedom and creativity of European car designers. A product differentiation strategy becomes less feasible. In congruence, as European automotive customers are offered less design options, price becomes the crucial argument at the dealership. Necessarily customer loyalty towards home brands suffers. Hence, with the exception of a few niche players all manufacturers turn towards cost cutting. In a reverse of the previous small and flexible production trend, European manufacturers rely again on economies of scale. High costs for transportation, especially through fuel prices, and an inadequate infrastructure with chronically congested roads make it difficult to sustain elaborated multi-plant multi-location value chains. European manufacturers have to refocus their production system. Most of them decide to leave only marketing and R&D facilities in Europe. The labour intensive production operations are at first completely shifted towards the new member states (NMS). As labour costs start rising there too, they

move further east. Naturally, some member states are hit harder than others. The burden weighs especially heavy on the largest member states. Some traditional production sites in these countries are harshly affected by this restructuring process. They are far more than just some production site but a symbol of national pride and prowess. As a result, keeping production and jobs there becomes the issue of intense political debate and union activism. In the end the respective governments respond with considerable subsidies. Those measures hamper the necessary restructuring process while jeopardising efficiency and hence competitiveness. As the outside pressures mount and the subsidised manufacturers struggle with high costs and inefficient production the idea of a mega-merger among European automotive producers begins to take shape. Afraid of foreign control, politicians fuel the idea of a European auto champion which realises the ultimate economies of scale and smoothes the reductions in workforce. This move succeeds in stabilising the European automotive production system but the shifts in market power leave the European customers worse off and stimulate import competition.

By 2019 the European automotive landscape has changed dramatically. Only three European producers service primarily their home market with more or less comparable commodity cars. Some smaller players survive serving niches in the domestic and foreign luxury car segments. They account for roughly 60% of the home market. 25 % are held by Japanese brands, the rest stems from low price imports from South Korea and China. Nearly 90% of all cars in Europe drive on diesel now. Almost 90% of diesel cars worldwide are sold in the EU. The world market for automotive products is dominated by Japanese manufacturers, while NAFTA and European producers have hardly any export success stories to tell. The vast majority of automotive production is performed on the Eastern border of the EU. EU employment in the sector is down to 350000 jobs that require market contact. The race is on for the new hydrogen engine that will shuffle the cards in automotive competitiveness anew.

6.2.2 European Automotive Industry: Taking the Pole Position

Within the next ten or fifteen years the European automotive industry has to face a lot of challenges but the industry as well as the policy makers do manage the impacts of globalisation and the upcoming principal legal stipulations.

The dependence on fossil fuels will still be a major topic on the automotive agenda but the alliance between OEM, suppliers, governments and petroleum exporting countries will be successful in terms of finding a balance between energy efficiency, sustainable oil markets, taxation and pricing. Nevertheless, the fossil reserve assets are still a limiting factor which could determine an oil price (IPE Brent Crude) in the long run at 30USD up to 32USD per barrel. In the past, the European automotive industry anticipated this trend and put a main focus on innovations concerning power engines having a high propensity to save energy. The situation of the USA is diametrically opposed. The American high level consumption of oil will still affect their economic system. Therefore, the chance of broadening diesel fuel not only for trucks but also for passenger cars is even more

a possible option nowadays. The European automotive industry does have a competitive edge concerning efficient and clear diesel technologies. The hybrid technology, fostered by Japanese manufacturers, could not really achieve acceptance of a bigger share of customers and technical progress in the area remains limited. It remains an idiosyncratic innovation concept used in some densely populated areas only, which will not have a global breakthrough. Consequently, diesel as an alternative will modify the ecosystem of the USA in terms of building up new diesel distribution channels. Due to the European technological advantage, other countries will pale in comparison which leads to an absolute export advantage of products including diesel technology. The European strategy of concentrating on diesel and fuel cell by neglecting the hybrid technology turns out to hit the right position. The groundbreaking innovation in commercialising fuel cell technology is not that far away. European governments call for zero emission cars by 2015 which heightens the pressure on the manufacturers' R&D efforts. The European industry is taking benefit by falling back on research experience from previous projects. By 2015, the fuel cell is not only one of the standardised products offered by European manufacturers but also the beginning of a new age of technology.

The European automotive industry, which is highly sensitive to the general economic situation, will experience a general positive economic trend. The risk of remaining static in relation to sales is a future challenge for each OEM, supplier and region. Europe will set a trend by developing the product differentiation strategy even further and discovering tailor-made cars for new consumer groups. Regarding the age pyramid, people will be far older than twenty years ago i.e. passenger cars need to have different features which satisfy the needs of older people. Even the female car drivers will have a bigger stake in the future which forces the manufacturers to emphasise feminine components of passenger cars.

With the accession of ten countries to the European Union the economic community has grown in size as well as being more heterogeneous. The NMS will report the fastest rates of growth of various economic indicators. Besides the fact that countries still give a very different picture concerning e.g. government deficit or debt, the improving economic situation will have a positive impact. Regions in the NMS which are lagging behind benefit from special EU enlargement programmes. The European automotive industry is taking advantage of a stable regulatory framework of the European Union and relatively low wages. To economise on cheap labour in the NMS, automotive production including the supply chain shifts from west to east. Therefore, the phenomenon of automotive clusters is not static but rather dynamic. New clusters will emerge in the NMS.

On the one hand the enlargement process had its previously climax by the accession of the NMS. On the other hand, the process of a further economic enlargement taking Russia and China into account is an incontrovertible fact. The European manufacturers managed to have a foot in the door of these new markets. It is a question of time when Russia is joining the WTO. Trade barriers will vanish into thin air. Hence, the propensity of export of the European automotive industry will be assisted by this development and assure the access to new markets. The living standard in emerging markets like China and Russia take a tremendous turn. Commodities and luxury goods are accessible to larger consumer groups. The

local value of cars shifts from a status symbol to a constant factor in the basket of commodities. OEM's and suppliers could take benefit of extraordinary possibilities for accelerating output and sales.

By 2020 2.5 million people will work in the automotive industry in Europe. The tripartition of Europe, Japan and the US in global car markets remains but weights shift. Europe controls now 55% of the world automotive output followed by Japan and the US. The fuel cell is part of almost every modern car by now. Pollution is no longer an issue as are traffic related deaths and injuries due to the development of active and passive safety features. The automotive sector is still the backbone of Europe's economy and other sectors are truly prospering in its shadow.

6.3 Policy Issues

In conclusion, it has been shown that the European automotive industry is currently in a strong position compared to its major rivals. Albeit this assessment is only a snapshot in time and there are major challenges and opportunities ahead. From our perspective the fate of the industry will primarily depend on the excellence and expertise of the individual companies. Improving productivity to revitalise the catching-up process is key for future European competitiveness. This is primarily the task of the automotive industry where companies must continue to invest in product and process innovation. Still, there is an important role for policy to play as an enabler and facilitator but more importantly by setting framework conditions and fostering stable macroeconomic growth. The main issues for policy arising from the report are as follows:

Excellence in Regulation

The European Union is increasingly important in setting the rules of the game. The number of regulations affecting the automotive industry has increased steadily in the last decade. Regulations follow different objectives and have different origins or starting points. Regulation at EU level augments and sometimes standardises regulation at the national level. The EU automotive industry is facing an increasingly intense web of regulations. The regulatory frame in many cases hurts the productivity catching-up process. Although impact assessment of regulatory policies is now the rule for all new regulations there will always be a dispute on whether a particular regulation will foster productivity and hence competitiveness or not. In order to revitalise the catching-up process future regulation must take long-term competitiveness as a top criterion when judging the economic impact of regulation. The regulatory framework for the EU automotive industry should be assessed and checked with regard to the consistency of this framework. In addition, future regulations have to take into account that EU automotive companies in order to exploit economies of scale and scope must be able to sell similar products in Europe and on the world market. Idiosyncratic regulation may tempt companies to invest in innovation which will only be successful in Europe and not on the

worldwide market. Those regulations will hamper further steps in catching-up to Japan and the US. Regulation also has to take into account that the development of new cars needs considerable time. As early as four years before market introduction the basic setup of a new car has to be determined. Any regulation introducing changes in core elements will induce significant additional cost affecting the whole value chain and hence will result in inefficient cars. So, the regulatory framework must be stable over the life-time of a car and changes in the regulatory framework must be forward-looking for nearly a decade to be efficient.

Enhancing Competition at Home

We welcome every measure to increase fair competition on the European home market. Strong competition on the home market is the best prerequisite for success abroad. While the process of creative destruction might hurt in the short run it fosters international competitiveness. Given that merger and acquisition will continue to be a major characteristic of the industry which is driven by the need to economise on scale and scope the framework for M&A activity in EU automotive industry should be strengthened and no short sighted national champion policy should be advocated. The productivity miracle in the French automotive industry in the second half of the 1990s may also be related to the privatisation of the French automotive industry.

The market is the single best mechanism to allocate resources efficiently and distribute incomes appropriately. Shielding Europe's automotive industry from world market trends through regulation would jeopardise its competitiveness. Fostering competition is not constrained to the car sector. Also the supplier and car parts industry will be stimulated to improve its productivity and competitiveness when market forces work at an international scale. Whenever possible we advocate a market based system to implement regulatory interventions.

Macroeconomic Framework

A stable macroeconomic framework is a keystone for success of the EU automotive industry. The sluggish growth in the 1990s in most European countries contributes to slow down the productivity catching-up. Revitalising growth in Europe will be crucial for the future of the automotive industry as one of Europe's key industrial sectors. The macroeconomic reform agenda is long and has been widely discussed elsewhere. Despite considerable steps in the last years there is still room for more flexible labour markets, improvements in existing company taxation systems, et cetera. In addition, there is a role for the Commission in order to help countries to gradually converge national frameworks in these areas so that location decisions of companies are based on prevailing differences in factor prices and factor endowments and not on differences in an ever changing regulatory framework.

In addition improvements in the macroeconomic framework are needed in order to make the EU more attractive to automotive R&D and innovation. The R&D support systems at least in some EU countries favour large firms. However, given the structural shifts in the automotive industry the need for R&D investment for small and medium-sized suppliers has increased considerably. In addition, the

R&D tax credit reform in Japan with highly favourable terms for SMEs will foster R&D investment. Hence, EU countries should carefully look for innovations in their R&D support systems.

Infrastructure Upgrade

There are two major lines of argument in favour of upgrading the road infrastructure. Firstly, a functioning road system is the necessary base for automotive usage. The large home market is one of the major sustainable competitive advantages of the automotive industry. In the long run Europeans will only buy cars if they provide them with the desired degree of mobility and flexibility. Both factors depend highly on a functioning infrastructure.

Secondly, road transports are the backbone of the European transportation system. While there is a certain rationale for internalising external costs, it should not be forgotten that lowering external costs of transport might also generate additional costs to the transport system and hence to broader industrial processes. The lack of alternative modes of transportation especially in the new member states as well as the requirements in flexibility and availability of logistics in a modern economy (including the automotive industry) make it necessary to strengthen the European road infrastructure. Neglecting Europe's prime pillar in transportation, the road, would jeopardise its competitiveness as a whole.

In addition, future transport needs, fuelled by new logistics, more intense division of labour and new characteristics of products, will require flexible modes of transport. Especially in this dimension road transport has some advantage against alternative modes of transport in terms of speed and flexibility.

Even now, the road infrastructure regularly turns out to be insufficient. The full integration of new member states will stimulate an additional demand for transportation. Hence, there is a strong need for additional investment in transport infrastructure.

EU Enlargement

With the accession of ten countries to the European Union in 2004, the economic community has grown in size but even more in heterogeneity. The expectations for the economic development of the new member countries are relatively positive, even if crucial reforms continue to be pursued. The new member states offer very important site-related factors for the automotive industry which are fundamental for their competitiveness. Therefore, a future need of high skilled labour has to be satisfied and a structure of important knowledge centres like universities have to be starched.

Promoting Free Trade

It has become clear that the European automotive industry is competitive on international markets. Still, this strength can only be fully utilised internationally if barriers to free trade are removed. While these include traditional tariffs and quotas, major non tariff barriers to free trade, e.g., the lack of international standards or the intellectual property rights framework, should also be considered. Especially in these fields the automotive industry needs support from policy. Moving

towards a higher degree of free trade especially with major emerging markets would certainly foster the competitiveness of the automotive industry.

Societal Goal: Reducing Emissions

The automotive industry recognises the importance of climate change. The industry has taken and will continue to take actions to contribute to long-term solutions. As a result of past industry investments, vehicle fuel efficiency has been steadily improving for many years. But these improvements have been more than offset by society's increasing demand for mobility (both people and freight) resulting in rising greenhouse gas emissions from road transport.

Cars will still be one of the most popular means of conveyance. Therefore, future efforts of the automotive industry have to focus on R&D to reach goals like zero emission or fuel cell as a standardised product within the next twenty years. Here, long-term but strict regulation is needed and new emission standards are called for. In addition, in the past tax policies proved to be important to set incentives for consumers to buy low emission cars. Hence, this strategy will probably prove successful in the future.