

# **Global appreciation of the Central European region along the enterprise value chain – The Case Study of the Volkswagen Group**

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## **1. Abstract**

Global value chains have transformed the world economy itself and incorporated a great number of economies into the network of international production. Because of this, several emerging economies grew due to the operation of the multinational companies. Thanks to the global value chain of the automotive industry, Central European countries have been involved in the global economy in the last decades. This study aims to describe the pattern of the global production network regarding the linkages of the Central European automotive industry through the enterprise case study of the Volkswagen Group. Based on statistical data and empirical analysis, the paper will prove that Central Europe has a key role not only in the successful relocation and fragmentation of automotive production, but also has a global position in the automotive industry. Via firm analysis of the Volkswagen Group, the paper describes the spatial distribution and the sharing of production among European, overseas and Central European affiliates. The paper illustrates the increasing global appreciation of the Central European region within the enterprise value chain.

## **2. Introduction**

In the last 25 years many economies were involved into the network of the international production, and because of this several emerging economies were appreciated due to the operation of the multinational companies (Gereffi 1999; Ernst and Kim 2002). However, global production networks and fragmentation of the production are not new phenomena (Arndt and Kierzkowski 2001; Baldwin 2012). The novelty of the global supply chains lies in the fact that before the 1970s, trade was happening between the mature (i.e., developed) economies – while from the late 1970s more and more industrialised developing countries have been involved in it. That meant that even more low cost countries joined into the global production (Humphrey and Memedovic 2003, Friedman 2005 and others), transforming their global position.

The repositioning and the embeddedness of the Central European countries into the global economy were led by their outstanding export growth. Examining export performance, Beltramello and his co-authors (2012) certified that as part of the global value chain, the four Central European countries (i.e., the Czech Republic, Hungary, Poland and Slovakia) were showing the best performances among the OECD countries in the period of 1995-2007. These strong international linkages have readjusted the global role of the Central European region, meaning that through their intermediate exports, they have not only European, but strong global linkages as well (Ando and Kimura 2013; Éltető and Toporowski 2013; Cieřlik 2014).

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Therefore many studies have been focused on the development of the export within the global value chains to describe the global position of the Central European region, including the differences regarding how deeply these emerging economies have been involved in the global value chains (Grodzicki 2014). Frank (2013) investigated the Slovak export towards the Asian countries. Comparing the figures between 2000 and 2011, machinery and transport equipment export shows an average growth in industry branches where multinational companies have an important role (automotive industry, consumer electronic industry). Guzik and his co-authors (2008) analysed the global linkages of the Polish software industry, while Plank and Staritz (2013) dealt with the integration of the electronics industry in Hungary and Romania into global production networks. The clothing industry of the Central European countries was covered by Smith and his co-authors (2014), and the Slovakian experiences were described by Pickles and his co-authors (2006). In addition to the Central European automotive industry showing an outstanding development in the last 25 years, it has also incorporated the economies of the region into the global value chain. Therefore, the unfolding of the global production linkages with regards to the Central European automotive industry has the most abundant literature – not only analysing the region (Jürgens and Krzywdzinski 2009; Pavlínek 2008; Pavlínek et al. 2009; Pavlínek and Ženka 2011; Barta 2012; Molnár 2012; Túry 2014), but locating/setting these emerging economies into the global value chain as well (Humphrey and Memedovic 2003; Schmitt and Van Biesebroeck 2013, and many others).

Regarding the global pattern of the intra-firm linkages of the automotive companies, regional integration is still the dominant trend on the production side, despite their global presence (Sturgeon and Florida 2000). Road vehicle manufacturers in Western Europe and North America heavily concentrate their production and sales activity to their home region. Based on this experience it is assumed that (in the case of Central European automotive companies) value chains are also organised within Europe.

### **3. Aim and method of the research**

According to the aforementioned interpretations, automotive production is organised in regional economic networks. This means that the Central European (Czech, Hungarian, Polish and Slovak) affiliates of multinational companies have strong linkages to production sites and markets in Western Europe. This “supply role” of the Central European region has been observed by several authors (e.g., Sturgeon and Florida 2000, Humphrey and Memedovic 2003; Barta 2012; Molnár 2012). The purpose of this paper is to demonstrate that global linkages show an alternative pattern to the theory of the regionally organised automotive value chains. Based on the existing literature and firm analyses of the Volkswagen Group, this study proves that the automotive production and the value chain of the OEMs (Original Equipment Manufacturers) are not arranged only along large regions, but – due to a worldwide cooperation of the production places – also globally. Jürgens in his firm analysis identified the Volkswagen as a “*Europe-oriented corporation*” (Jürgens 1992, p. 68.). Despite the globalisation of the Volkswagen Group in the last three decades, Europe still has the key role here according to employment and sales figures. The aim of this study is to complement the automotive value chain interpretations via exploring the global linkages of the affiliates located in Central Europe. Our hypothesis is based on the fact of the increased capacity of the affiliates in the Central European countries, where the volume of the production exceeds the European sales of the Volkswagen Group. The modularisation and specialisation of the production and the international division of labour both have key roles in this phenomenon. In this new globalised economy Volkswagen may stay a Europe-oriented company only via the production of the Central Eastern European affiliates. The sites’ international relations are all managed here to maintain the company’s position in the European continent.

By 2015, the Volkswagen Group had over 119 production points in 31 countries worldwide (including the MAN and Scania brands). The backbone of this research consists of the statistical analysis of the Volkswagen Group's intra-firm trade between 2010 and 2015. Mapping out the directions of relations helps verify and supplement a number of earlier theories (Sturgeon and Van Biesebroeck 2011) on the development of Volkswagen, shedding light on newer correlations.

#### **4. Linkages among the global value chains – the automotive sector in Central European countries**

As mentioned in the previous section, several research studies have focused on the development of exports within the global value chains to describe the global position of the Central European region, including differences regarding the extent to which these emerging economies have been involved in global value chains. According to the literature, despite the global presence of the transnational companies, regional networks of intra-firm linkages are still the dominant trend on the production side. Automotive manufacturers heavily concentrate their production and sales activities within large regional areas. Based on this experience, Central European production points are Europe-based because they have strong intra-firm trade linkages to their parent companies and their products are sold mainly in Western European markets.

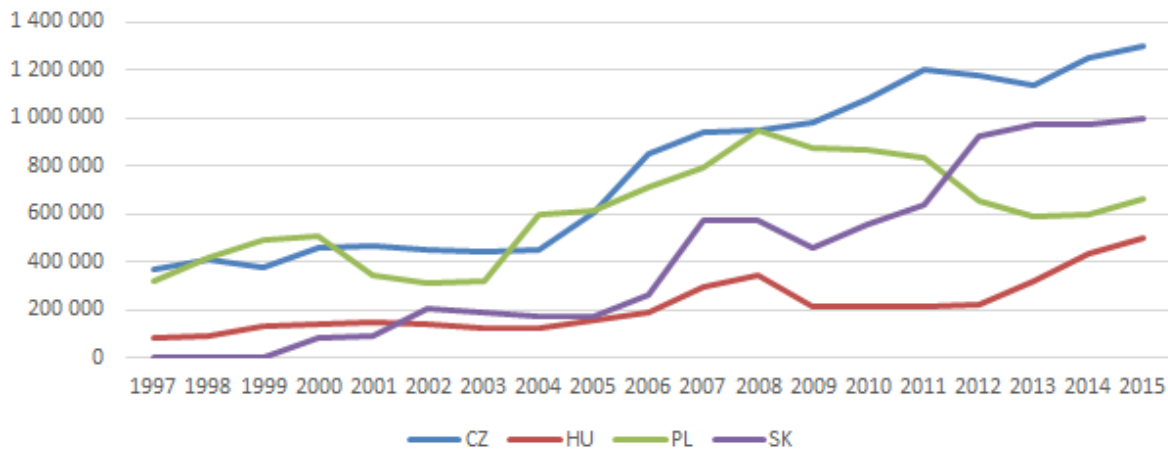
Covering the whole spectrum of automotive industry in the Central European countries is legitimated on the one hand by the increased mergers and acquisitions (M&A) of the commercial vehicle industry in the past years. It results an increased size of the global value chains including the Central European production sites as well. On the other hand, in some countries production of commercial vehicles and buses gives an increasing share in the automotive industry. In Poland the share of the commercial vehicles (including production of buses) rose from 13.0 percent to 19.1 percent between 2004 and 2015 (OICA 2016). Decreasing share of the production of the commercial vehicles also shows the changing production structure and decreasing number of the actors in the region. Several traditional companies ceased operations because of lack of demand or and changing global strategy of the foreign owner. There are several companies ceased like the Ikarus and NABI bus manufacturers in Hungary, light commercial vehicles manufacturer Avia<sup>2</sup> in the Czech Republic, or Korean Daewoo Motors' affiliate in Poland. Some restructured their operations, like Jelcz and Autosan bus manufacturers in Poland.

#### **Figure 1: Road motor vehicle production\* in Central European countries**

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<sup>2</sup> In July 2016 the holding CZECHOSLOVAK GROUP (CSG) bought the automaker Avia from the Indian company Ashok Leyland Motors. According to their plan, production will be restarted in the future (Source: <http://www.avia.cz/cs/media/tiskove-zpravy/holding-czechoslovak-group-koupil-od-indicky-vlastniku-automobilku-avia/>).



\* Passenger cars + light commercial vehicles + heavy trucks + buses and coaches; excluding semi-knocked-down and complete knock-down assemblies.

Source: author's calculations based on OICA production statistics between 1997 and 2015

In 2015, nearly 3.5 million vehicles rolled off the production lines (see Figure 1) in the four Central European countries: the Czech Republic, Hungary, Poland and Slovakia (OICA 2016). This represents 16.4 percent and 3.8 percent of European and world outputs respectively. The Central European countries' share in European output is almost three-fold (2.8 times higher) since 2000 and the rate more than doubled (2.5 times higher) of world output. This development is even more dynamic if we also consider that the share of CE countries in the manufacturing of passenger cars in the European economic area<sup>3</sup> has increased more than seven-fold from 1996 to 2015 (ACEA 2016a; OICA 2016). Looking back since the European accession production has been increasing from 1.3 million to 3.5 million vehicles per year. Contrary to international trends, the manufacturing of passenger cars became completely dominant in these countries. Compared with the global and European average of 75 percent and 89 percent respectively, 96 percent of vehicles manufactured in the region were passenger cars in 2015. The vast majority of passenger car models assembled in the Central European countries are so-called economy- or subcompact and compact cars, but premium category vehicles are also manufactured here (in the Bratislava, Mladá Boleslav and Győr plants of Volkswagen, Škoda and Audi Hungaria Motor respectively).

The automotive industry in the Central European region is rather heterogeneous, despite the more or less similar local resources (tax incentives, low production costs, well-established infrastructure) in the economies. This can be explained – among other things – by the different ways these countries opened up to foreign investors in 1990s, the industrial traditions of individual countries, the outputs of local subsidiaries of international companies.

To ensure their market presence and to boost their competitiveness (Dunning 1993) the big European and overseas carmakers use the specific attributes of the region to relocate some of their activities, just like companies from the Far East do. Mainly Japanese (Suzuki Motor Corporation, Toyota Motor Corporation) and South-Korean (ex Daewoo Motors, Hyundai Motor Group) companies have set foot and established a stronghold for their expansion into Western Europe (Hyun 2008, p. 226.).

Ten car manufacturing companies from Japan to the U.S. and another half dozen automotive firms (in the bus and truck industry) currently have almost three dozen production sites throughout Central European countries (see Table 1). Almost every main carmaker and their

<sup>3</sup> Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia, Austria, Belgium, Finland, France, Germany, Italy, Netherlands, Portugal, Spain, Sweden and the United Kingdom.

suppliers, which account for 80 percent of world production, are present in the region. It will come as no surprise that given developments in the 2000s, the region has been labelled the “new Detroit” (Unicredit 2007).

**Table 1: Automotive OEMs in Central Europe<sup>4</sup>**  
(in 2015)

parent company	subsidiary	location (country/city)	founded/ purchased	production	staff	export share as total
Volkswagen AG/AUDI AG	Audi Hungaria Motor Kft.	HU/Győr	1993	engines, parts, car assembly	11,411	99.6%
Daimler AG	Mercedes-Benz Manufacturing Hungary Kft.	HU/Kecskemét	2008	car assembly	3,715	99.7%
Suzuki Motor Corporation	Magyar Suzuki Zrt.	HU/Esztergom	1991	car assembly	3,100	93.9%
General Motors Europe Ltd.	Opel Szentgotthárd Autóipari Kft.	HU/Szentgotthárd	1991	engines, components, remanufactures transmissions	1,204	96.0%
Kühne Zrt.	Kravtex Kereskedelmi Kft.	HU/Győr	1992	buses	78	2.5%
General Motors Europe Ltd.	General Motors Manufacturing Poland Sp. z o.o.	PL/Gliwice	1998	car assembly	2,930	96.5%
	General Motors Powertrain Poland Sp. z o.o.	PL/Tychy	1996	engines	550	n.a.
Toyota Motor Corporation	Toyota Motor Industries Poland Sp. z o.o.	PL/Jelcz- Laskowice	2002	engines	798	n.a.
	Toyota Motor Manufacturing Poland Sp. z o.o.	PL/Wałbrzych	1999	engines, transmissions	2,040	n.a.
Volkswagen AG	Volkswagen Poznan Sp. z o.o.	PL/Poznań	1993	components, car assembly (vans)	7,765	98.5%
		PL/Września	launched in October 2016	vans	up to 3,000	n.a.
	Volkswagen Motor Polska Sp. z o.o.	PL/Polkowice	1999	engines	1,300	n.a.

<sup>4</sup> The Original Equipment Manufacturer (OEM) is a company that makes a part or subsystem that is used in another company's end product.

	Sitech Sp. z o.o.	PL/Polkowice	1998	seating components	1,640	n.a.
Fiat Automobiles S.p.A.	FCA Poland S.A.	PL/Bielsko-Biała	1971/1992	engines, components	3,239	n.a.
		PL/Tychy	1971/1992	car assembly	3,340	99.5%
Solaris Bus & Coach S.A.	Solaris Bus & Coach S.A.	PL/Bolechow	1996	buses, trams	2,000	77.6%
Volkswagen AG /Scania AB	Scania Production Slupsk S.A	PL/Słupsk	1993	buses	390	100%
Volkswagen AG/M.A.N. SE	MAN Truck & Bus Polska Sp. z o.o.	PL/Poznań		buses, components	976	98.5%
		PL/Starachowice	1948/1999	components of buses	1,420	n.a.
		PL/Niepołomic e-Kraków		trucks	438	76.2%
Volvo AB	Volvo Polska	PL/Wroclaw	1995	heavy trucks, buses	2,300	99.2%
Jelcz	Jelz Sp. z o.o.	PL/Wroclaw	1952	trucks, components	430	n.a.
Fiat Group	Kapena	PL/Włynkówko	1968/2003	buses		n.a.
Solbus	Fabryka Autobusów Solbus Sp. z o.o.	PL/Solec Kujawski	2001	buses	150	n.a.
Volkswagen AG	Škoda Auto a.s.	CZ/Mladá Boleslav	1895/1991	engines, gearboxes, components, car assembly	20,414	90.9%
		CZ/Vrchlabí	1946/1991	gearboxes	779	
		CZ/Kvasiny	1934/1991	car assembly	3,374	
Toyota Motor Corporation - PSA Peugeot Citroën	Toyota Peugeot Citroën Automobile Czech s.r.o.	CZ/Kolín	2002	car assembly	3,200	99.6%
KIA-Hyundai	HMMC-Hyundai Motor Manufacturing Czech s.r.o.	CZ/Nošovice	2006	gearboxes, car assembly	3,400	95.3%
Tatra	Tatra a.s.	CZ/Kopřivnice	1897	heavy trucks, military vehicles	1,345	65.3%
Sor Libchavy spol. s. r. o.	Sor Libchavy spol. s. r. o.	CZ/Libchavy	1991	buses	628	40.6%
Fiat Group	Iveco Czech Republic, a.s.	CZ/Vysoké Myto	1895/1994	buses	2,891	91.9%

Volkswagen AG/M.A.N. SE	PBS Turbo s.r.o.	CZ/Velká Bíteš	1956/2000	components	197	n.a.
KIA-Hyundai	KIA Motors Slovakia s.r.o.	SK/Zilina	2004	engines, components, car assembly	3,800	99.0%
PSA Peugeot Citroën	PSA Peugeot Citroën Slovakia	SK/Trnava	2003	car assembly	3,500	99.5%
Volkswagen AG	Volkswagen Slovakia a.s.	SK/Bratislava	1971/1991	car assembly	8,417	99.3%
		SK/Martin	2000	components	815	n.a.
		SK/Kosice	2004	assembly, logistic	168	n.a.
		SK/ Stupava	2014	tool production	n.a.	n.a.

Source: data collected by the author based on ACEA (2016b) and corporate reports

The role of the automotive industry in the Central European economies has increased tremendously in the past 20 years or so. Its average share (manufacturing of motor vehicles: NACE Rev. 1.1 DM34 and NACE Rev. 2 C29) in the gross value added of the manufacturing industry grew four-fold from 3.5 percent in 1995 to 14.0 percent in 2014 (Eurostat statistical database 2016). The economic importance of the industry varies greatly from country to country because the automotive industry in the region is anything but homogeneous. The types of vehicles and the individual models are different, while the value added also varies. The industry is highly important in terms of employment (see Table 2), compare to the European figures. Considering the total share of the automotive industry, i.e., indirect contribution including production and service activities connecting to supplier industries, its share in employment could be 5-6 times the figures cited above (ACEA 2016a, p. 13.).

**Table 2: The share of the automotive industry within the national economies: detailed data of the manufacture of motor vehicles, trailers and semi-trailers (NACE Rev. 2 C29)**

Country	Employment (2014)		GVA (2015/see notes)
	Employees (1000)	Percent of manufacturing employment	Percent of the manufacturing GVA
EU28	2 359.83*	7.5*	9.7*
Czech Republic	162.29	12.2	19.3
Hungary	92.85	12.0	20.2
Poland	246.80	8.2	8.9**
Slovakia	62.65	13.1	18.8
: not available; * 2013; ** 2014			

Source: author’s calculations based on Eurostat statistical database: National Accounts employment data by industry and National Accounts aggregates by industry

Despite outstanding figures, based on gross value added per employee, it is clear that the region has generally more labour-intensive activities (Barta 2012, p. 57.; Sturgeon and Biesebroeck 2011, p. 188.; Vass 2005, p. 5.). The region has its biggest advantage with regard to production costs. Comparing labour cost levels between Western-Europe and the Central and Eastern European we see that the difference is fivefold, benefitting the CEE countries (PWC 2013). Geographical proximity to the main markets is also a crucial factor investing into the EU10 countries (Schmitt and Van Biesebroeck 2013).

While the direct and short-term impacts of the operations of foreign companies at corporate and regional levels can be measured (employment, growth in output, encouraging further investment, profits reinvested and growing exports), indirect and long-term impacts do not transform into figures very easily. We can specify expectations which, given the primary impacts, represent vertical and horizontal spillovers of corporate- and industry-level modernisation (preserving jobs, expanding employment, increasing real incomes as well as in-house technology and knowledge transfer (Mišun and Tomšík 2002, p. 57.). The differences in competitiveness between foreign and domestic enterprises, however, highlight a key problem. They have led to the creation of parallel development tracks, dual economies, (Pavlínek 2004) and at the same time so-called “cathedrals in the desert” in emerging economies (Morris 1992). The quality control (quality, deadlines, cost factors, the ‘just in time’ system) export-oriented companies are isolated, and establish an insignificant number of relations with domestic companies (Pavlínek 1998; Pavlínek and Smith 1998; Swain 1998); these relations are also tied to the TIER 2 and TIER 3 level of the supply system.

The engine of economic growth in the Central and Eastern European region is the expansion of exports (from this point of view, Poland with its sizeable domestic market is an exception). Thanks to FDI, the corporate sector and the export focus of the countries increased in the CEE region (Djankov and Hoekman 1996; Jensen 2002). Earlier, in the first half of the 90’s, the most typical investments were labour intensive and generated lower added value; these were followed later by major investments in electronics and machine manufacturing representing higher technological levels (Barta 2012). The automotive industry has an outstanding position regarding foreign capital invested in the Central and Eastern European region: the industry has exceeded 40 billion USD FDI in the past two decades (Pavlínek et al. 2009). As a result, production value in the manufacturing of motor vehicles increased sharply; by fivefold between 1990 and 2015 (UN Industrial Statistics Yearbook 1990; OICA 2016). Making up for lost time, Slovakia attracted record FDI from the late 90’s, as a result of which the industry grew seventeen-fold, which was unprecedented in the region in the aforementioned period. Therefore the output has been growing since beginning of the 2000’s and the export share of automotive sector in the Central European countries has been growing tremendously (see Table 3). Against to the three Central European countries Poland has stagnating figures.

**Table 3: Share of automotive products in the exports of selected countries**  
Percent of total

	2000	2005	2010	2015
Czech Republic	16.1	17.0	18.1	21.1
Hungary	16.9	16.4	14.3	22.0

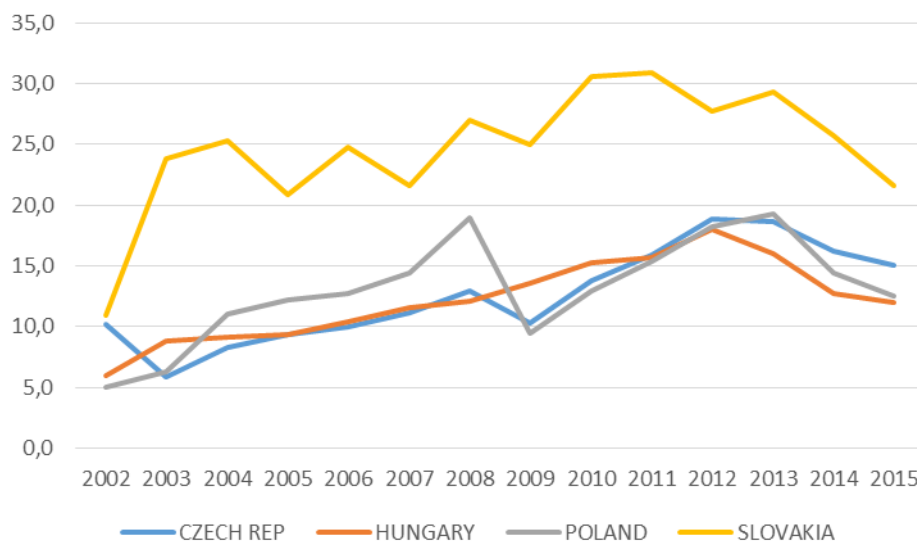


Poland	12.6	16.0	14.8	12.0
Slovakia	20.2	18.1	20.9	28.5

Source: author’s calculations based on Eurostat Comext 2016

In addition to local market-seeking motives (Volkswagen 1991, p. 11.), automotive investments in Central European countries built their capacities largely on exports. For example, 98-99 percent of the Czech automotive output was exported in 2015 (AIA 2016). The export rates in 2014 and 2015 for the different companies vary from year to year; while the biggest exporter is Škoda Auto, which exports 90.9 percent of its production, the Japanese-French Toyota Peugeot Citroën Automobile (TPCA) group exports 99 percent of its production. The rates are very similar in Hungary and Slovakia as well (see Table 1). What is more, in spite of its rather large domestic market, Poland has also similarly high export rates.

**Figure 2: The volume of the extra-EU automotive export**  
Percent of total automotive export



Source: author’s calculations based on Eurostat Comext 2016

Foreign trade linkages are influenced by the intra-firm positions of the affiliates in global production chains of the foreign firms. Regarding automotive export directions, the most “EU dependent” countries were Hungary and Poland in 2015, with 87.4 percent and 88.0 percent of all automotive exports respectively. In the intra EU trade, Germany is the biggest partner for the countries. Regarding extra-EU trade, there was an increasing trend in all countries since the beginning of 2000 (see Figure 2), what figures were dropped after 2013. Slovakia has the biggest extra EU trade share in 2000 and 2011 almost of the one third of the total automotive export went to third countries.

## 5. Volkswagen as a global player

In 2015 the Volkswagen Group, with its production of 10 million vehicles (from motorcycles to heavy trucks), was the second largest automotive company in the world, after the Japanese

Toyota Motor Corporation. The company consists of three divisions: financial services, automotive and commercial vehicles. Also, the favourable innovative background of the company allows for leveraging additional potential along the value chain (Volkswagen 2013, p. 126). The main scope of the Volkswagen Group is the automotive division. The company produces twelve brands, which constitutes a wide spectrum of supply. Besides this the company has a large geographic extension in the case of markets and production plants as well. Since 1948, when the first export vehicles went to Europe, Volkswagen has been steadily increasing its sales in abroad. In 2015, the Group sold its vehicles in 153 countries, all over the world from Iceland to New Zealand. Concerning the geographical distribution of the production, Europe still plays a decisive role. VW Group operates 119 production plants worldwide, where 97 places are in 20 European countries and a further 48 places in 11 other countries in the overseas regions (Volkswagen 2016).

Due to the conquest of new markets and cooperation and acquisitions, Volkswagen is a transnational company that involves more resources from abroad than from its home country Germany. The foreign share has grown in the case of sales revenue since 1956, in the case of foreign production since 1993, and in the case of employment abroad since 2008 (Volkswagen 2008). The foreign component of total activity is often used to measure the level of internationalization. It refers to assets, sales, production, employment or profits of foreign branches or affiliates (United Nations 1973, p. 4). In 1995, the United Nations Conference on Trade and Development (UNCTAD) introduced the transnationality index (TNI), which ranks transnational companies by the amount of their foreign activities. The index is calculated from the ratio of foreign assets, foreign sales, and foreign employment as a ratio of total values (UNCTAD 1995, p. 23). The TNI index for Volkswagen for the period from 1993-2010 grew from 43.3 to 60.8 percent, clearly indicating the company's globalization.

In recent years, the company has continued to increase its foreign exposure. In 2015, foreign share in production was 73 percent, in vehicle sales it amounted to 87 percent and in the case of employees it represented 54 percent (Volkswagen 2016). The picture is quite asymmetric, showing that increasing internationalism on the side of allocation activities in the value chain is rather unequal.

Regarding revenues, the automotive division has a decisive role. With passenger cars and light commercial vehicles representing 78 percent and the division of trucks and buses accounting for 11 percent of total revenue, it has the largest share in the Group. Power engineering accounts for 2 percent and the financial services division for 10 percent of total revenue.

In order to compare the detailed data, we take into account the latest available figures from 2010.<sup>5</sup> In terms of *sales*, Asia – mostly the Chinese market – has had an outstanding role since the early 2000s. However, sales revenues in Germany and Europe are still dominant (see Table 4). The North and South American markets proved to be stable in recent years. Apart from maintaining its share of the strategic market of Europe and increasing sales in East and South Asia, the main target for the Volkswagen Group has been to regain the U.S. market (Browning and Lohscheller 2011). The peak years were at the beginning of the 1970s: in 1970 sales in the U.S. market were close to 600 thousand units. Since then, due to the rise of new competitors, Volkswagen has been losing its market share. Concerning the geographic distribution of production locations, most are located in Europe and Asia.

**Table 4: Regional distribution of the production, sales and workforce of the Volkswagen Group in the main markets and production locations**  
(in 2010)

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<sup>5</sup> From the mid-2000s, the data for production and for employees are not included in the Volkswagen's annual reports. As a result of detailed research work by the author, data from 2010 are available.

<b>country/region</b>	<b>production <i>units</i></b>	<b>sales <i>units</i></b>	<b>workforce <i>persons</i></b>
Germany	2,115,000	1,062,652	178,291
Rest of Europe	1,824,445	1,864,352	79,270
Europe (total)	3,939,445	2,927,004	25,7561
USA	0	358,500	0
Mexico	434,685	131,000	15,290
Brazil	1,067,105	727,790	26,303
Argentina	87,073	145,800	6,500
South Africa	119,613	72,279	5,634
China	1,692,517	1,924,649	39,980
India	50,019*	53,555	4,459

\* mainly from completely knocked down (CKD) kits

Source: based on the author's compilation of business data and other official/governmental organizations

A company with wide vertical and horizontal extension should seek to coordinate activities within the company. An inadequate structure of technology development and production in such a multi structure company may cause a significant competitive disadvantage vis-a-vis other competing companies. There have been examples in the past, such as integrated engine development in the 1970s, when parallel developments at Volkswagen, Audi and Porsche, were integrated (Tolliday 1995, p. 117.) as a basis of the company's success. This integration had become necessary due to the emergence of new competitors and a decline in competitiveness in the 1970s. Besides increasing global production, enhancing international competitiveness through a competitive internal structure is currently the main target for the company (Volkswagen 2010, p.198.). Therefore, the organizational structure of the company responds to internal and external challenges. Globalization means a structural step forward following international production and sales. Thinking globally for a company means (Eisenberg 2011, p. 10):

- Global production and platforms;
- Global design – no or minimum local adaptation;
- Global sourcing of local materials;
- Worldwide cooperation with suppliers;
- Flexibility in selection / changes of the production sites.

According to Pries (2003), Volkswagen is a “globally operating transnational company” since the beginning of the 1990’s. The concept of Pries is based on the transformation of cooperation between the subsidiaries and the parent company. He took into account the spatial configuration of resources, functions, competencies and power between headquarters and plants. In the case of corporate governance and profit strategies, this means that the company has followed a globalised centralism and intra-organizational competition strategy since the 1990s. In practice, this means that carrying out a value activity in an affiliate is not only a question of ability, but of which subsidiary can make it the cheapest. The assignment of tasks is the result of

competitive bidding within the company (Audi Hungaria 2014). Therefore, all analyses involving the company’s global value chain constitute only a snapshot.

**6. The role of Volkswagen’s Central European subsidiaries within the company’s global value chain**

In the following section the paper will examine Volkswagen affiliates in the Central European countries (i.e. in the Czech Republic, Hungary, Poland and Slovakia). The study deals those Volkswagen companies which produce motor cars and light commercial or leisure activity vehicles. We will not cover affiliates that produce heavy commercial vehicles (trucks) and buses. On the one hand, such production exists only in Poland and thus would distort the picture. On the other hand, they are formerly independent companies (MAN and Scania) which were integrated only a few years into the global production of the Volkswagen Group. We take into account Škoda Auto in the Czech Republic, Audi Hungaria Motor in Hungary, Volkswagen Slovakia in Slovakia, Volkswagen Poznań, Volkswagen Motor Polska and Sitech in Poland. During the research, an unforeseen problem was faced, which reduced the number of firms with statistical data. In Poland there is no public e-access to the financial reports of companies. For the case of Poland we only have the companies’ press releases and business registration documents from the National Register of Court.

**6.1.1. Skoda auto**

In 1991, when Volkswagen AG acquired 31 percent of the shares in Škoda Auto, the Czech automaker was in quite bad shape (Pavlínek 2008, pp. 102-103.), Škoda was the typical example of a company from the socialist planned economy. In the late 1980s only 28 percent of production was exported (Pavlínek 2015, p. 354.), and vehicles could only be sold in the Eastern bloc countries (former socialist economies). Volkswagen invested into reorganisation and integrated the Czech brand into the Group’s automotive production. Twenty-five years after Volkswagen acquired interests in the Czech company, Škoda has become a global brand. While in the early 1900’s Škoda cars were exported to only 30 countries (Pavlínek 2015, p. 354.), today the Czech company is active in more than 100 markets. Under the umbrella of Volkswagen Group, sales in Western European and overseas markets began, and global production was launched as well. In addition to the Czech Republic, Škoda vehicles are made in Europe (Bosnia and Herzegovina, Russia and Ukraine) and Asia (China, India and Kazakhstan) as well. In those production locations assembly is from parts and components exported from the Czech Republic.

In 2015 more than one million Škoda autos were manufactured, constituting 10.5 percent of the personal vehicle production of the Volkswagen Group. The Czech automaker is the third largest brand – after Volkswagen and Audi – within the Volkswagen Group. Škoda is a global brand, therefore autos are made not only in Czech Republic (717,249): almost one-third (31%) of the total output is assembled abroad (see Table 5). There are production plants in Slovakia (41,280), Russia (53,032), India (12,676) and China (268,116). If we look at the figures we can see that three of the four foreign affiliates produce for local markets. Czech and Slovak production is exported into foreign markets, mainly to European countries.

**Table 5: Production and sales, ranked by deliveries to customers**

	Production (vehicles)	Deliveries to customers (vehicles)
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Total Škoda brand	1,039,321	1,055,501
China	268,116	281,707
Germany	-	158,747
Czech Republic	717,249	85,005
United Kingdom	-	74,879
Russia	53,032	55,012
Poland	-	50,039
...		
Slovakia	41,280	18,252
...		
India	12,676	15,829

Source: Skoda Auto 2015, pp. 21-23.

On the other hand, because the Czech company is part of the Volkswagen Group, production covers not only Škoda cars but other brands from the Group, including parts and components. In 2015 Škoda assembled 19,728 Seat vehicles in the Czech Republic and 14,445 Volkswagen and Audi cars worldwide at its foreign plants.

Regarding component manufacturing at Škoda, in 2015 624,760 engines and 1,020,723 gearboxes were produced. The components are not channelled solely into internal production, but are also intended for other Volkswagen Group brands. We cannot provide a picture of its regional allocation: we only know that 41 and 67 percent of the production (respectively) goes to exports, i.e., 254,524 engines and 688,425 gearboxes were produced for other brands (Škoda auto 2015, p. 20). The production figures also show that additional gearboxes and engines are needed for Škoda's vehicle production, which the company purchases from other Volkswagen subsidiaries, so intra-firm linkages on the demand side are also active.

Based on Škoda auto's annual reports, there is an increasing number of Volkswagen and Škoda affiliates which have intra-firm relations with the Czech company. For instance, in 2015 Škoda Auto gained new contracts for delivering vehicles with Audi Volkswagen Korea Ltd., Porsche Colombia S.A.S. and Porsche Croatia d.o.o. New contracts for sales for genuine parts, bodyworks and other products were signed with not only European affiliates but an even higher number of South American and Asian partners (Škoda auto 2015, p. 108).

Regarding intra-firm linkages within the Volkswagen Group, since 2011 there is no detailed data published on the receivables from companies controlled ultimately by the parent company: only the main partners are indicated. The figures in 2010 show remarkable trade relations with the South American (Volkswagen do Brasil Ltda.), South African (Volkswagen of South Africa (Pty.) Ltd.) and Chinese (Shanghai Volkswagen Automotive Co. Ltd.) affiliates. Based on the latest figures concerning the period 2010 and 2015, there is an increasing trend in export volume to companies controlled by the ultimate parent company (see Table 6). Regarding trade with the Russian partner (OOO VOLKSWAGEN Group Rus), because of the decreasing demand in

the Russian market there is a consistent export decline. In the case of trade relations and market expectations with India, local assembly started in 2002. At that time half of intra-firm trade was realised with the Indian subsidiary (Škoda auto 2003). Because of the increasing local content, the trade of the goods and services (receivables) has been continuously decreasing, from 31 percent in 2003 to 25 percent in 2005 and to 15 percent in 2007 (Škoda auto 2004, 2006, 2008). Today, intra-firm trade with Škoda’s Indian subsidiary – as proportion of intra-firm trade – is marginal.

**Table 6: Spatial pattern of intra-firm linkages**  
Sales to related parties as percent of total intra-firm sales

	2010	2011	2012	2013	2014	2015
Volkswagen AG	6.3 %	5.3 %	2.2 %	4.0 %	3.5 %	3.5 %
Companies controlled by ultimate parent company	61.6 %	76.1 %	48.6 %	52.7 %	56.5 %	88.1 %
Germany	n.a.	n.a.	28.9 %	27.4 %	28.7 %	–
India	n.a.	n.a.	1.3 %	0.8 %	0.8 %	0.9 %
EU	n.a.	n.a.	2.7 %	2.7 %	2.5 %	2.8 %
Russia	12.1 %	16.3 %	15.0 %	11.5 %	7.4 %	4.0 %
Other related parties	20.0 %	2.4 %	1.3 %	0.8 %	0.7 %	0.7 %

Source: Škoda auto a.s. Annual Reports 2010-2015

### 6.1.2. Audi Hungaria

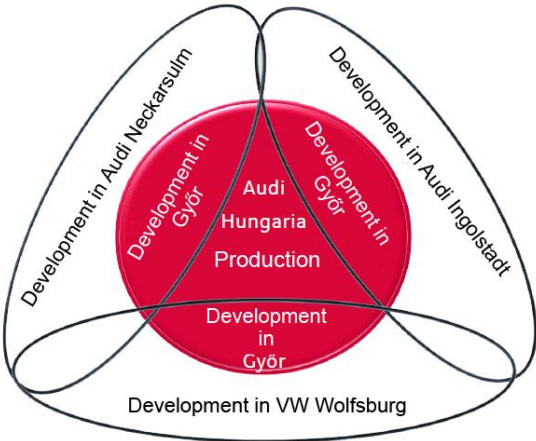
The Audi Hungaria Motor Kft. based in Győr, develops and manufactures engines for Audi AG and worldwide locations of the Volkswagen Group, as well as for other “third” partners.<sup>6</sup> There are also car assembly activities in cooperation with the Ingolstadt factory of Audi AG. Audi branded cars were assembled in various Volkswagen production plants, like in Slovakia, Russia, Spain, China, India and Indonesia, but because of the Audi Hungaria is the largest engine factory in the Volkswagen Group the subsidiary has a unique position within Audi AG. Due to continuous investments – since its founding in 1993, Audi AG has invested a total of 8.7 billion euro in Hungary<sup>7</sup> – on behalf of Audi AG, activities have been expanding. Car assembly started in 1998, and the Engine Development Centre was opened in 2001. Due to continuous investment the Győr plant is the only Audi factory to produce the TT sport vehicles (TT models are produced completely at the Hungarian subsidiary) and export to all around the world. Audi Hungaria produced a total of 2,022 thousand engines and 160 thousand vehicles, and employed 11,353 workers (on average) in 2015. Today, Audi Hungaria is one of the biggest exporters and a leading automotive company in Hungary.

<sup>6</sup> Companies not belonging to the Volkswagen Group

<sup>7</sup> [http://www.mfor.hu/cikkek/vallalatok/Rekord\\_arbevetel\\_az\\_Audi\\_Hungarianal\\_is.html](http://www.mfor.hu/cikkek/vallalatok/Rekord_arbevetel_az_Audi_Hungarianal_is.html)

As part of the Volkswagen Group it has several partner locations worldwide, with which the company has direct and indirect linkages. The whole structure and the decision-making mechanism of the company are highly centralized by Audi AG in Ingolstadt, Germany (Audi Hungaria 2014). Concerning linkages in the value chain and among the production sites, there are two types of cooperation: joint technological development and intra-firm trade. In collaboration of technology development, there is joint engine development managed by Audi AG (Audi Hungaria 2014). All development is coordinated by the Volkswagen Group. Concerning R&D there are no duplications, development flows in parallel and improvements are based on partial results (see Figure 3). Engines are developed in Győr for Audi, Volkswagen and Porsche models as well.

**Figure 3: Linkages of the technological development operating at Audi Hungaria**



Source: author, based on Demmelbauer-Ebner 2012. p.21.

Regarding engine production within the Volkswagen Group – similarly to Audi Hungaria – there is a modular approach to enable harmonized worldwide production (Schmidt 2012) and ensure the flexible implementation of the global value chain. Standardization of mounting orientation creates increasing efficiency and potential exchange of know-how and best practices among the Group affiliates.

The Hungarian subsidiary has linkages mainly with the Audi AG and Volkswagen AG (see Table 7), but with other Volkswagen companies in Europe, Mexico, China and India also has relations.<sup>8</sup> Looking at the figures, the ties with the parent company became stronger until the trade linkages with European and Chinese production plants were weakened. In the case of the Chinese relations, the figures show remarkable changes. The reason for this is the large-scale investments in Chinese production since 2010 (Mull 2011), whereby the local content of Chinese production increased.

**Table 7: Spatial pattern of intra-firm linkages**

Sales to related parties and affiliates to the above detailed countries, as percent of total intra-firm sales

	2010	2011	2012	2013	2014	2015
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<sup>8</sup> Volkswagen de México, S.A. de C.V.; FAW-Volkswagen Automotive Company Ltd.; Volkswagen FAW Engine (Dalian) Co. Ltd.; Shanghai-Volkswagen Automotive Company Ltd.; Skoda Auto India Private Limited

Audi AG	59.9 %	58.3 %	55.7 %	60.6 %	73.7 %	75.5 %
Volkswagen AG	9.6 %	8.5 %	8.8 %	9.1 %	7.4 %	4.8 %
Germany	1.0 %	3.8 %	4.8 %	5.6 %	4.9 %	5.3 %
EU	16.5 %	16.6 %	15.9 %	12.1 %	8.9 %	10.7 %
China	12.1 %	12.0 %	13.4 %	11.1 %	4.0 %	2.2 %
Mexico	0.9 %	0.8 %	1.4 %	1.0 %	0.7 %	0.4 %
USA	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
India	0.0 %	0.0 %	0.0 %	0.4 %	0.4 %	1.0 %

Source: Audi Hungaria Motor Kft., Kiegészítő melléklet 2010-2015

### 6.1.3. Volkswagen Slovakia

Volkswagen Bratislava s.r.o. was founded in 1991 as a joint venture of Bratislavské automobilové závody (Bratislava Automobile Company) and Volkswagen AG. Car assembly were started in the same year, in the production hall of Bratislavské automobilové závody. Production of gearboxes was launched in 1994. Production increased and large-scale investments started after 1998, when the company became a wholly-owned subsidiary of Volkswagen AG. In 1999 the company changed its name to Volkswagen Slovakia. The Bratislava factory produces small city cars and sport utility vehicles (SUV), car bodies and gearboxes. In the following years several new production locations were founded. In 1999 the Martin factory of Volkswagen Slovakia started the production of car components (differential gears, flanges, flanged shafts, brake drums and brake wheels). From 2004 the Košice plant has been preparing Volkswagen semi-knocked-down (SKD) assembly kits (Volkswagen Slovakia 2016) for the Russian market. The fourth factory of the company opened in Stupava in 2014. The new technology center produces plant components for vehicle production, which are used not only in Slovakia but in other group plants. The product range includes innovative devices and tools such as locking tongues, manipulators, or machine protection components.

In 2015 Volkswagen Slovakia produced 397,458 cars, and in addition the Bratislava plant produced 262,400 gearboxes. Production in the plant in Martin increased by 4.3 percent and reached a historic record of 36.4 million components. The number of employees was 10,820, with most of work in Bratislava, while the second-largest is the Martin factory with more than 800 employees.

Concerning trade linkages within the global value/supply chain, the biggest partner is the parent company (see Table 8). Volkswagen AG has a 53.43 percent share of all delivered goods and services. At the same time, since 2012 the importance of the parent company has been decreasing, with an increasing number of deliveries realized to the entities under control of the Volkswagen Group.

**Table 8: Spatial pattern of intra-firm linkages**

Deliveries of goods and services to the related parties

	2012	2013	2014	2015
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Volkswagen AG	68.93 %	65.23 %	63.23 %	53.34 %
Entities under control of the Volkswagen Group	31.04 %	34.73 %	36.73 %	46.62 %
Associated companies within the Volkswagen Group	0.03 %	0.03 %	0.03 %	0.04 %

Source: Volkswagen Slovakia a.s. Účtovná zvierka between 2013 and 2015

Volkswagen Slovakia is Slovakia's largest exporter. It is the only Volkswagen factory to produce the models Volkswagen Touareg, Audi Q7, Volkswagen up!, Seat Mii, Škoda Citigo and the car bodies of the Porsche Cayenne (Volkswagen Slovakia 2015). The vehicles are exported to 148 countries worldwide. Taking into consideration the export figures (see Table 9), Volkswagen Slovakia is Europe-oriented. At the same time, one-quarter of trade is directed to overseas countries, i.e., into the USA and China. Exports to the US have been growing constantly during the observed period, while exports to China decreased from 21 percent to 10 percent. To explore the reasons, we need to examine the product portfolio. Next to the components, there are small cars and SUVs. The main market for small cars (up!, Citigo, Mii) is Europe; SUV cars go to the USA and China. For example, the Slovak vehicle export to China consists mainly of SUV (Audi Q7 and Volkswagen Touareg) cars produced in Volkswagen's plant in Bratislava (Gradziuk and Szczudlik, 2015). Therefore, the volume of the production and the export ratios are highly influenced by Chinese demand.

**Table 9: Export relations of Volkswagen Slovakia**

	2010	2011	2012	2013	2014	2015
Export total, m EUR	4,000	5,160	6,500	6,480	6,100	7,100
Export ratio	99.3 %	99.8 %	99.7 %	99.7 %	99.7 %	99.6 %
Germany	36.0 %	41.9 %	40.2 %	33.7 %	33.7 %	36.8 %
USA	n.a.	8.7 %	n.a.	10.4 %	11.3 %	13.4 %
China	n.a.	21.1 %	9.5 %	19.9 %	17.5 %	10.0 %
United Kingdom	n.a.	n.a.	7.1 %	n.a.	n.a.	n.a.
Russia	n.a.	5.3 %	n.a.	n.a.	n.a.	n.a.

Source: press releases of Volkswagen Slovakia a.s., TASR

#### **6.1.4. Volkswagen in Poland**

If the automotive industry has a major role in the economy and foreign trade in Slovakia, then in Poland Volkswagen has the dominant role within automotive output. Thanks to acquisitions of Volkswagen AG, today there are eight production locations (see Table 1) in Poland. The product portfolio is broad, from component manufacturing to the assembly of buses and trucks. Volkswagen produces automotive components and assembles vans in Poznań. In Polkowice Volkswagen Motor Polska manufactures engines, and Sitech produces seating components. At

the end of October 2016 a new factory opened in Września, producing vans (Volkswagen Crafter). Swedish firm Scania, the majority of which is owned by Volkswagen AG, has a factory in Słupsk where buses are assembled. Volkswagen-owned German MAN has a bus and component factory in Poznań, a component manufacturing factory in Starachowice and a truck production facility in Niepołomice-Kraków.

### *Volkswagen Poznań*

The company began in 1993 when Volkswagen set up a joint venture with the Polish company Tarpan in the Polish city of Poznań. The assembly of Volkswagen Transporter 4 from semi-knocked-down (SKD) kits began. Volkswagen became a full owner in 1996. In the early period the plant also produced Škoda, Seat and Audi models<sup>9</sup> for the local market, until 2002 when Volkswagen T5 and Caddy vans began to be produced. Today the Polish affiliate has two production locations. In Poznań body building, paint shop and assembly and an aluminium foundry (heads, steering gear housing) are located, while the production of components for welding and installation cockpits takes place in Swarzędz.

In 2015 Volkswagen Poznań made some 170,800 units in Poland.<sup>10</sup> At the end of 2015 there were 7,765 employees at the Volkswagen affiliate (Volkswagen 2016). The factory has a Special Car Body Department where 32,355 units have been completed. Special Volkswagen Caddys (van) and Volkswagen Transporter 5 were ordered by customers including Deutsche Post, the German and Polish police. The Volkswagen's Poznań foundry ended the last year with manufacturing 3,548,128 components. In 2014 98% percent of production went to export markets, mainly Germany.

### *Volkswagen Motor Polska.*

Assembly of internal combustion engines began in the Polkowice plant in 1999. Production was continuously improved at the affiliate. Until the end of 2012, four-cylinder pump-injector diesel engines were produced. Parallel to this the production of common rail engines started in 2008. From 2013 production of the latest engine generation (the Modular Diesel System – MDB) was started.

In 2015 there were 678,600 four-cylinder diesel engines assembled for Volkswagen Passenger Cars, Volkswagen Commercial Vehicles, Audi, Škoda and Seat models.<sup>11</sup> In the factory also produced engine components – including cylinder heads, camshafts and crankshafts, crankcases, connecting rods and integrated valve gear modules – for diesel engines for other Volkswagen plants around the world. Engines from Polkowice were delivered to Volkswagen Poznań and to other Audi, Seat, Škoda and Volkswagen plants in Germany, the Czech Republic, Portugal, Spain, India, Mexico, USA and South Africa as well.<sup>12</sup> The importance of the international relation is indicated by the fact that since 2011, the Polkowice plant is the only supplier in the company that sends 2.0 CR (common rail) engines to the assembly plant in Chattanooga, USA.

### *Sitech*

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<sup>9</sup> <http://www.volkswagen-poznan.pl/en/news/2-500-000-cars-volkswagen-poznan>

<sup>10</sup> <http://www.volkswagen-poznan.pl/pl/news/volkswagen-poznan-zrealizowal-plan-2015-roku>

<sup>11</sup> [https://www.volkswagen-media-services.com/en/detailpage/-/detail/Volkswagen-Motor-Polska-Sp-z-oo/view/3475099/680154b15b8a7325830b8b8b1e42389f?p\\_p\\_auth=zw2VFh6X](https://www.volkswagen-media-services.com/en/detailpage/-/detail/Volkswagen-Motor-Polska-Sp-z-oo/view/3475099/680154b15b8a7325830b8b8b1e42389f?p_p_auth=zw2VFh6X)

<sup>12</sup> <http://www.vwmp.com.pl/Produkt.html>

Sitech Sp.z.o.o. was established in 1998 as a joint venture of Volkswagen AG and the Germany company KWD GmbH. Three years later the German company Sitech Sitztechnik GmbH was founded. Since 2003 Sitech has become a wholly-owned subsidiary of Volkswagen AG.<sup>13</sup> The company has five production locations: next to the Polish factory there are three sites in Germany (Wolfsburg, Hanover, Emden) and one in China (Shanghai).

In 2015 there were 1,650 people working at the factory, where about 11.7 million components (back structures, frames, consoles, headrests) were produced. The export partners are Volkswagen factories in Germany, China, Argentina, India, Mexico, Russia, South Africa, Czech Republic, Spain, Slovakia and Hungary (Sitech Sp.z.o.o. company report 2016).

## 6.2. Global role of Central Europe's Volkswagen subsidiaries

Volkswagen's value chain is organised globally, but Europe still has a decisive role. Europe's share is preponderant in the globally organised processes of production and sales. Within Europe, the spatial distribution is follows: Germany and Central Europe are marked by production, while Western European export markets can be characterised by consumption countries, despite being home to some Volkswagen production locations. Analysing intra-firm trade, Germany and Europe have a dominant role: as mentioned above, automotive production is organised along regional economic networks, where Central European sites have a "supply role" (Sturgeon and Florida 2000; Humphrey and Memedovic 2003; Molnár 2009; Barta 2012). Beside this regional organization, intra-firm linkages of the examined companies show some alternative relations. Central Europe has an important role within the Group because several unique components and partial units are manufactured there. Audi's factory in Győr is the largest engine factory within the Group and also the only factory where producing Audi TT models. Poland has its unique position with the production of diesel powertrains. Škoda is a global brand that exports finished and semi-knocked-down (SKD) vehicles and also main parts not only to Europe but to overseas countries as well. Volkswagen Slovakia has a unique position within the Group, because it is the only Volkswagen factory to produce the models Volkswagen Touareg, Audi Q7, Volkswagen up!, Seat Mii and Škoda Citigo. Volkswagen Motor Polska exports engines not only to Europe but to Volkswagen's U.S. factory as well.

Based on the analysis of the intra-firm relationships, the strength of the linkages depends on not only the global allocation of production vs. demand but on other, quantitative and qualitative factors as well. On one hand, qualitative factors mean the production of many models that were reallocated, or new models that were started to be produced in the *Central European production locations, therefore Central European production has a unique position not only in Europe but globally as well*. Certain components and parts are also produced exclusively in Volkswagen subsidiaries. Export means not only complete vehicles, but also booming intra-firm trade in parts and partial units globally.

On the other hand, the quantitative factor is the allocation of the production of the model range and the capacity of the production. Also, capacity utilization, i.e., economies of scale, causes geographical differences regarding demand and supply to increase of intra-firm trade between Central Europa and overseas countries. *Central European countries have a competitive advantage due to low production costs. The distribution-based production system (Pries 2003) can be maintained only up to a certain level of demand of the overseas markets*. Example are the case of Škoda's Indian trade relations or Audi Hungaria's Chinese relations.

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<sup>13</sup> <http://www.sitech-sitztechnik.de/unternehmen/daten-und-fakten.html>

**Figure 4: An example of the complexity of the global value chain: the EA111<sup>14</sup> motor delivering/production matrix for assembly of the Volkswagen Polo**



Source: Eisenberg 2011, p. 13.

During analysis it became clear that the mapping of cooperation within the value chain is complex (see Figure 4). We examined cooperation in the value chain concerning vehicle assembly and engine production. Based on the analysis of the relationship, linkages depend on the current model or model range and on the capacity of the production plant (as internal factors). Also, capacity utilization, i.e., economies of scale, causes geographical differences regarding demand and supply. *Thus, mapping of the linkages regarding the frame or network of the intra-company trade can only serve as a snapshot. Multi-supplier linkages to a certain production sites point to the next factor. Opening a new production site or starting engine production in a new place may result from limits on capacity expansion at existing sites* (Audi Hungaria 2014). Also, cost efficiency calculations relating to the production plants are an important factor. As previously mentioned, the assignment of tasks is the result of competitive bidding within the company (Audi Hungaria 2014; Schmid and Grosche 2008).

## 7. Conclusion

Due to the global value chain of the automotive industry, Central European countries have become involved in the global economy in the last decades. Based on statistical data and empirical analysis, the paper proved that within Volkswagen Group, Central Europe *has an important role not only in the European automotive industry but globally as well*. Via firm analysis of the Volkswagen Group, the paper describes the spatial distribution and the sharing of production among Western and Central European affiliates, as well as the role of the Central European affiliates in the global value chain. The paper illustrates the increasing global appreciation of the Central European region within the enterprise value chain.

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<sup>14</sup> The EA111 series is an internal combustion engine series, which was introduced in the mid-1970s by Audi.

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