

Microeconomics of Competitiveness



Slovakia: Automotive Cluster

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Introduction

When on December 11th, 2015 Jaguar Land Rover (JLR), a Tata group company, confirmed its plans to open a new \$1.5 billion factory in the town of Nitra in Slovakia, it became the fourth large automaker moving to the Central European Republic. Since the entry of Volkswagen in 1991, Citroën/Peugeot and Kia had built auto manufacturing plants in 2003 and 2004 respectively. In less than 22 years, since its split from Czechoslovakia and independence, the Slovak Republic became the largest per capita producer of autos in the world in 2007, with almost 1 million vehicles rolling out of factories in the Republic with only 5.4 million population in 2014. In 2015 the industry represented 43% of the industrial output and a quarter of its exports.

Slovakia's National Competitiveness

Overview of the Republic of Slovakia

Located in Central Europe, on 19,000 square miles lands inhabited for almost 4,000 years, mostly mountainous and landlocked, Slovakia is one of the youngest states in Europe. It shares borders with the Czech Republic and Austria to the west, Ukraine to the East, Poland to the north and Hungary to the south. Its population is just over 5.4 million and its capital is Bratislava. Though its origins are traced back to the state of Great Moravia in the 9th century, it was part of the Hungarian Kingdoms for almost a thousand years, and then part of the Habsburg Empire. After World War I, Slovakia became part of the newly created country of Czechoslovakia, in 1918. In 1939, Slovakia briefly seceded from Czechoslovakia until 1945. After being liberated by the Soviets, it was brought under the influence of Moscow and was rejoined with the Czech Republic, into the Socialist Republic of Czechoslovakia.

As part of the Communist centrally planned system, Czechoslovakia first tried moderately opening up economically and to liberal politics in the late '60s, which resulted in an occupation by the Soviet Union and its allies in August 1968. Czechoslovakia broke free from the Soviet sphere in 1989, through the peaceful Velvet Revolution. In June 1990 it held its first democratic

elections since 1948, and Czechoslovakia was reformed as a federal state, consisting of the Czech and Slovak Republics.

Right from the beginning the new entity was faced with the challenge of rebuilding the economy, previously centrally planned from Moscow, into a market economy system. Finding itself with hundreds of state owned companies employing virtually its entire workforce, Slovakia took steps towards rapid privatization and opening up to foreign investment. But there were tensions between the two republics, mostly on the nature of the reforms, and the power division between the federal and republic governments. As a result, following elections in both republics in June 1992, the two newly elected governments agreed on a split of Czechoslovakia, which was made official in December 31st, 1992, voted by the parliaments of both republics. From January 1st, 1993, Slovakia was a sovereign state.

Setting out on its own

The newfound independence was not easy for Slovakia, as most of the central institutions of government had been left in Prague, and had to be recreated. A major issue for the newfound Republic was the fact that it had trailed the Czech Republic economically, as its industrialization under the Communist regime was defense oriented, and with the fall of the Eastern Block, had also lost most of its markets. As a result the shift to market economy was marked by adversity and large scale unemployment, with GDP in 1993 a reported 74% of what it had been in 1989¹. As a result of opening up its markets, Slovakia also exposed its inefficient textile and electronics industries to international competition, resulting in more lost jobs and high inflation.

With a few short months off, Vladimir Meciar was Prime Minister of Slovakia from 1992-1998. Faced with the crisis, Meciar decided to roll back the previous economic plans, retracting privatizations, protection of the Slovakian markets from foreign investments and centralization of the economy. His governance was called “Illiberal Democracy²,” as state enterprises were given to party supporters, and payrolls inflated with subsidized employment in chemical

¹ <http://www.slovak-republic.org/history/democratic-slovakia/>

² <https://www.foreignaffairs.com/articles/1997-11-01/rise-illiberal-democracy> (Fareed Zakaria, 1997).

factories, hotels, agriculture and steel plants. The Slovakian Government became authoritarian, with the opposition excluded from Parliamentary commissions, and corruption and nepotism ambivalent. As a result Slovakia was not included in NATO and EU candidate lists, losing ground to its neighbors both politically and economically. Though growth averaged 5.4% (1994-1998), current account deficit averaged 9% (1996-1998), FDI inflow was limited compared to the region at only \$6.6 billion, only 1.6% of GDP (1993-1998). In 1998 Merciar lost the elections to Mikulas Dzurinda.

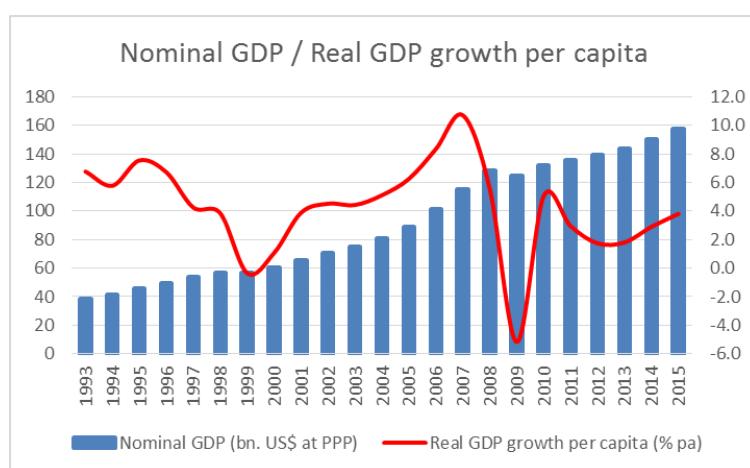


Figure 1: Nominal GDP/Real GDP growth per capita

Economic Reforms

Dzurinda's four year mandate was a mandate of fiscal consolidation, reigning in public spending and debt, while opening the economy up to foreign investment as a source of growth. His mandate was marked by two sine qua non factors: vast improvement to business climate and the continuation of Slovakia's integration to the EU and NATO. One of Dzurinda's first initiatives was a thorough restructuring of the banking sector, bearing a huge cost, undoing the web of loans to state agencies and the banks, thus opening the sector to international companies.

Dzurinda's government also undertook the privatization of the strategic utility companies, telecommunications, electricity distribution and gas. This was followed by removal of regulated pricing systems and establishing independent regulators, while new legislation on bankruptcy

and improving the rights of lenders contributed to improved business climate. The government exerted no pressure for overemployment, freeing companies and funds for further investment. However, the economic reforms and public finance measures came at a high cost. The jobs that were shed by the public companies led to record unemployment in 2001, 19.2%, the highest in Europe, up from 12.6% in 1998. The restructuring of the public finances lowered subsidies and cut spending, which in turn slowed economic growth. During his second term Dzurinda focused on structural reforms, increasing economic freedom, establishing a fixed rate tax level (at 19%), while lowering the budget deficit through pension and health reform.

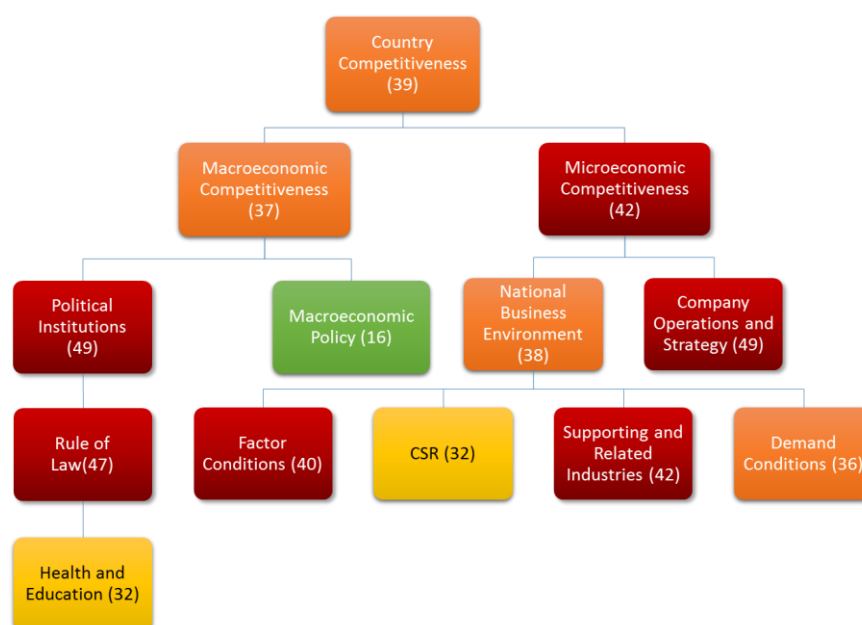


Figure 2: Country competitiveness

As a results of these reforms Slovakia became a OECD member in 2000. On March 29th, 2004 it became a member of NATO and soon thereafter, on May 1st, 2004, it became part of the EU. Productivity increased especially in manufacturing, and foreign direct investment continued to go up, and Slovakia has successfully attracted companies like Citroen/Peugeot, Kia, Emerson Electric, Samsung Citibank, TRW, Visteon, AT&T, HP, Microsoft, Johnson Controls, Dell, Deutsche Telecom, Intesa BCI, Raiffeisen, Enel and more.

In 2005 economic growth went to 6.1% from 1.9% in 1999. Unemployment went down to 11%, while Slovakia moved closer to the more advanced economies of its neighbors³. These structural reforms and gradual integration into European markets, coupled with skilled and abundant labor force attracted foreign investors. Foreign Direct Investment stocks increased from just €2.8 bn in 1999 to €36.2 bn in 2008 before the onset of the financial crisis. FDI inflows into automotive, electronics and machinery industries contributed a significant improvement in labor productivity, increased fourfold between 1997 and 2013. The increases in labor productivity contributed around 4.3 percentage points to GDP per capita growth each year (3/4 of the total growth). In addition, higher employment rate contributed to around 1.4 percentage point annually to the GDP per capita growth.⁴

However, in 2006, due to lingering unpopularity because of the tough reforms, Dzurinda lost the elections to leftist Robert Fico. Fico's government continued the EU market integration efforts and it became a Eurozone member in January 2009. Slovakia has become one of the most open economies in Europe with the average of exports and imports reaching 90% of GDP in 2013. However, the global economic crisis exposed the vulnerability of Slovakia's export-oriented growth model, as its real GDP per capita declined by 5.2% in 2009. This was driven predominantly by decline in foreign investment and trade, with exports falling by 15% and imports by 20%.⁵ The efforts to limit Slovakia's exposure to the global market shock had limited success, as the economy remained specialized in downstream stages of production of autos and electronics. Slovakia's inability to diversify its production base and move upstream in the value chain can be attributed predominantly to the lack of investment in research and development and inadequate human capital.

³ <http://www.cato.org/publications/commentary/tatra-tiger-may-be-endangered-opposition-market-reforms>

⁴ Nicolae-Dragos Biea, Economic growth in Slovakia: Past successes and future challenges, ECONOMIC BRIEF 008 | MARCH 2015

⁵ Klein, Caroline et.al, "Slovakia: A Catching Up Euro Area Member In and Out of the Crisis", IZA Policy Paper No. 55

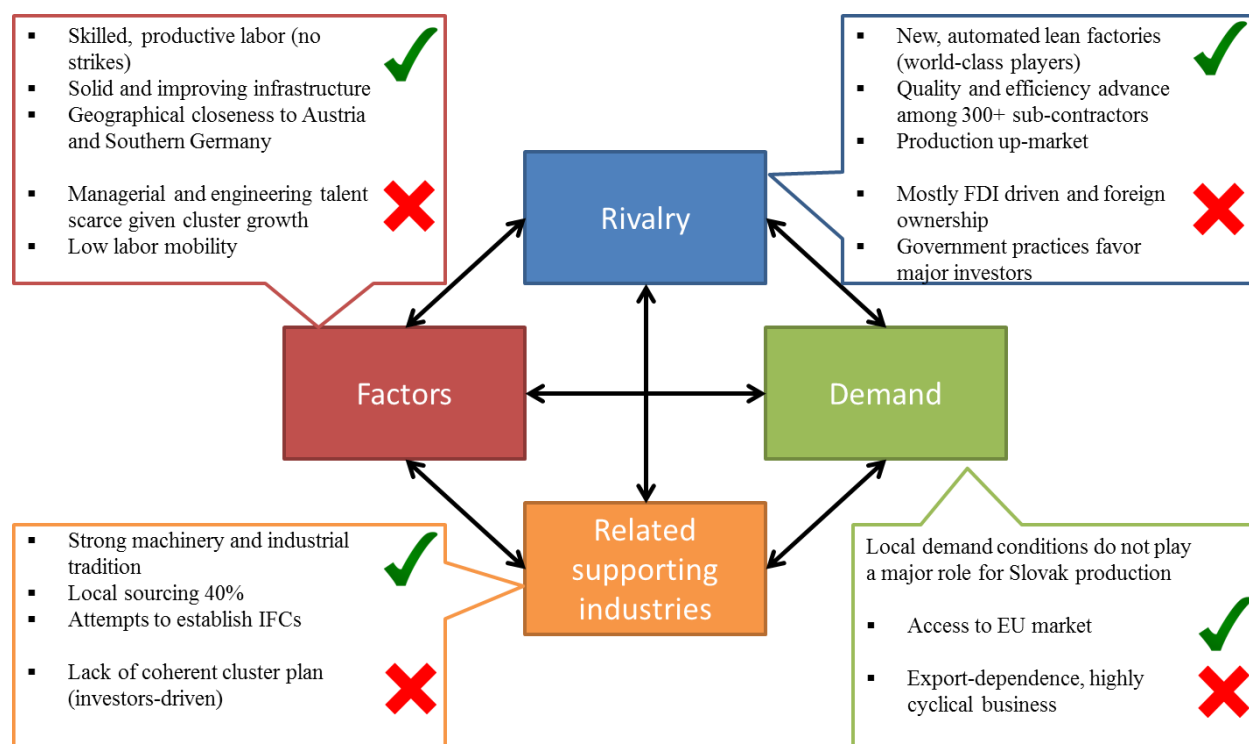


Figure 3: National Competitiveness Diamond

Factor Conditions

Slovakia's FDI inflows and resulting economic growth were driven by its relatively skilled labor with **high levels of enrollment in primary and secondary education**, as well as **technical tertiary education**. In recent years, however, the educational standards have deteriorated, as there has been a marked increase in "low achievers" in all areas surveyed in PISA studies, with particularly strong impact of students' socioeconomic background. Inadequate teacher education and remuneration, low participation in early childhood education and low inclusion of marginalized groups, especially the Roma population, have all contributed to the deterioration of the educational system.⁶ At 27% tertiary education attainment has remained at low levels (EU average is 38%), partly due to a very small proportion of students attending professionally-oriented undergraduate programs linked to the labor market.⁷

The 2009 recession was brief, but had significant long-term impacts on the labor market, as growth in labor productivity decreased and the unemployment reached double figures again – at

⁶ <http://www.cedefop.europa.eu/en/news-and-press/news/slovakia-pisa-and-piaac-worrying-skill-survey-results>

⁷ European Commission, *Country Report Slovakia 2016*, February 2016, p.27.

11.5% in 2015 it has still to reach the pre-crisis levels and is substantially higher than in the neighboring economies. Potential growth is significantly depressed by high prevalence of long-term unemployment, concentrated particularly in the poor eastern and southern regions. Youth unemployment is close to 30%, among the highest in the EU. Despite Slovakia's rapid economic convergence, regional disparities remain among the largest in the EU. Jobs are mostly created in the wealthiest regions, especially in the western part and near Bratislava. **Poor infrastructure in the remote regions** discourages investment and job creation in less dynamic areas, and regional disparities are aggravated by low labor mobility, and a flawed mechanism of transition from school to work, or from unemployment back to employment.⁸

Low levels of Research & Development investment is another factor significantly hampering Slovakia's potential economic growth. In 2014 Slovakia invested around 0.89% of its GDP in R&D, which is a marked improvement from the pre-crisis low of 0.46%, but still significantly lower than in the neighboring countries and the European average of 2.12%.

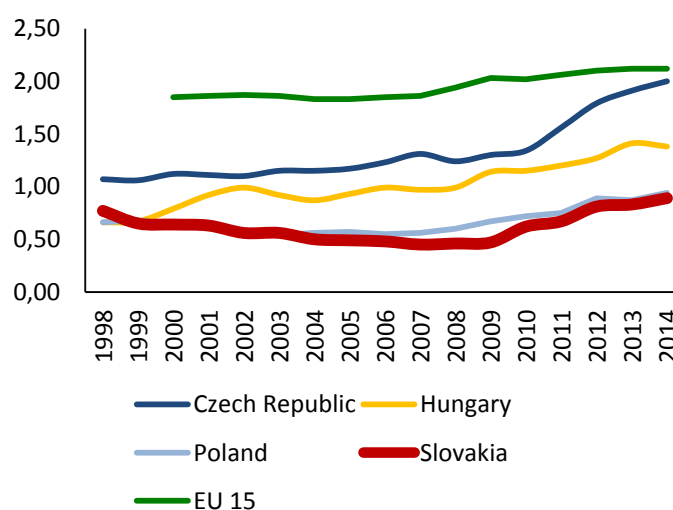


Figure 4: R&D investment (% of GDP)

Cooperation between competent ministries and agencies has been fragmented, as the responsibility over R&D and innovation projects is divided among numerous agencies.

⁸ Kurekova, Lucia, et. al "Implementation of Activation Works in Slovakia: Evaluation and Recommendations for Policy Change", Slovak Governance Institute, 2013.

Similarly, Slovakia is lacking a coherent framework for promoting cooperation between academia and industry on commercialization of research outputs.

Rivalry

Labor productivity in Slovakia, particularly in the manufacturing sector, has increased dramatically since early 2000s and has been a major driver of the economic growth. The wage increases have been largely offset by the increases in productivity, containing growth in unit labor cost and preserving thus Slovakia's price competitiveness relative to regional competitors. Slovakia's economy has also benefitted significantly from deep integration in global value chains, rooted in **low foreign trade and investment barriers**. The foreign value-added content of Slovak exports is the second highest in the EU, reflecting large share of foreign-owned ownership of export-oriented manufacturing companies.⁹

However, business activity in certain sectors, particularly in services and network industries, is hampered by **high regulatory burden** and **barriers to entry**. Excessive regulation and lack of effective anti-monopoly policies in sectors such as, electricity, gas, telecom, post and rail is resulting in comparatively high industrial input prices and undermine Slovakia's competitiveness relative to its neighbors. Furthermore, although the overall tax burden in Slovakia is low and attractive for large investors, the **tax wedge for low-income workers** is above European average, disincentivizing labor supply and demand.¹⁰

Related Supporting Industries and Demand

As a small country and former member of the communist bloc and the Czechoslovak federation, Slovakia historically developed significant local capacities in particular industries, especially in heavy manufacturing, such as machinery, metallurgy, transportation or weaponry that have been heavily export-oriented and have since played a vital part in development of the current automotive and electronics manufacturing capacities. We discuss these aspects in detail in the cluster section of this paper.

⁹ OECD, *Interconnected Economies: Benefiting from Global Value Chains*, 2013.

¹⁰ European Commission, *Country Report Slovakia 2016*, February 2016, p.22.

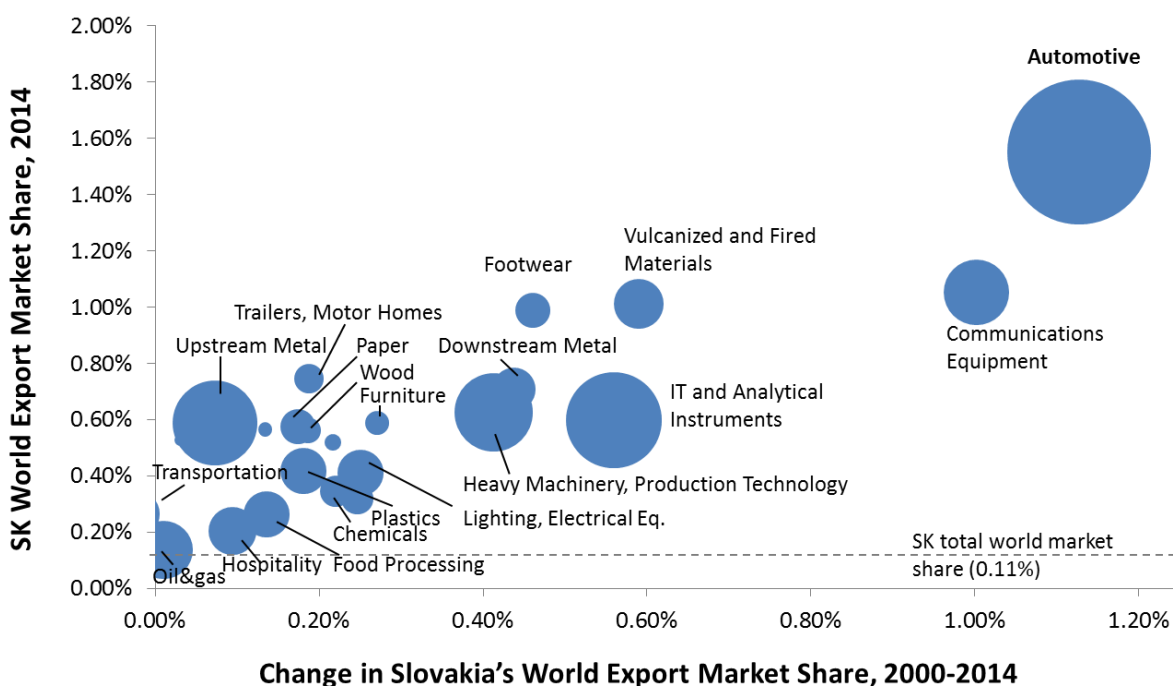


Figure 5: Clusters representing ~90% of Slovak Exports¹¹

Automotive Cluster in Slovakia

History of the cluster¹²

Czechoslovakia had one of the oldest histories of car manufacturing in Europe. The roots of the industry can be traced to Moravia, in 1850 with the company named Tatra that produced railways cars. In 1897 inspired by the Benz automobile Tatra build the first car and it was named Präsident, the automobile made it to Vienna exhibit.

Even though Slovakia did not have its own brand, the vibrant Czechoslovakian automotive industry played important part in the kick-start of its own national production. Apart from Tatra, in 1925, an automotive company called Skoda would be established, the first company to specialize in the design of the cars, which in later times would spark manufacturing in Slovakia. The last part of the 19th century and the beginning of 20th century would find Czechoslovakia with state automotive as such Tatra, Skoda, AVIA and LIAZ.

¹¹ Source: ICCP data on Slovak and World Export Market Shares, 2000-2014

¹² Slovak Investment and Trade Development, Agency Automotive Industry (<http://www.sario.sk/en>)

In the 50's and 60's Slovakia started to create its own production capacities by establishing the first automotive company named TAZ and which focused in producing vans. The real difference maker for Slovakia would be the creation of Bratislava Automobile Factory (BAZ) in 1971 and which would produce Skoda licensed models. BAZ at the beginning served for certain products for Skoda and TAZ, but due to almost 400 researches and employees and its own Department of Motor Vehicle Development they launched the first car serial car production in 1982. TAZ closed down after the fall of communism while BAZ would continue until 1991 when acquired by VW.¹³

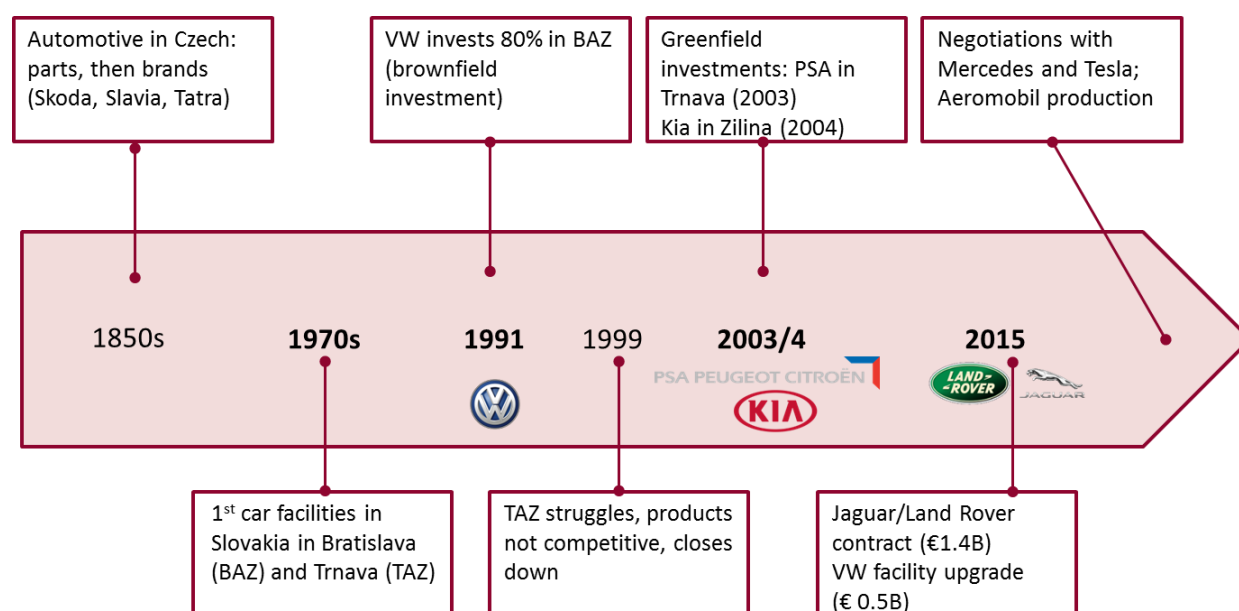


Figure 6: Slovakian Automotive cluster timeline

A new era for Slovak automotive industry would start with the 1991 arrival of German automotive company Volkswagen in Slovakia. Volkswagen expansion in Central Europe started with Skoda in Czech Republic but in the same year it continued through buying an 80% stake in BAZ in the Slovak Republic. Due to the obsolete nature of production facilities in the region VW would keep the buildings but invest in new equipment and technology.¹⁴ After a slow start the

¹³ AutoNet, *Notes on the Automotive Industry in Central Europe* Framework Policy Document http://www.central2013.eu/fileadmin/user_upload/Downloads/outputlib/Autonet_Framework_Policy_Document.pdf

¹⁴ Jakubiak et al. *The Automotive Industry in the Slovak Republic, Recent Developments and Impacting Growth*. COMmission on growth and paper, Working paper No29

industry would begin to develop and the arrival of foreign companies would foster the local sub-suppliers networks.

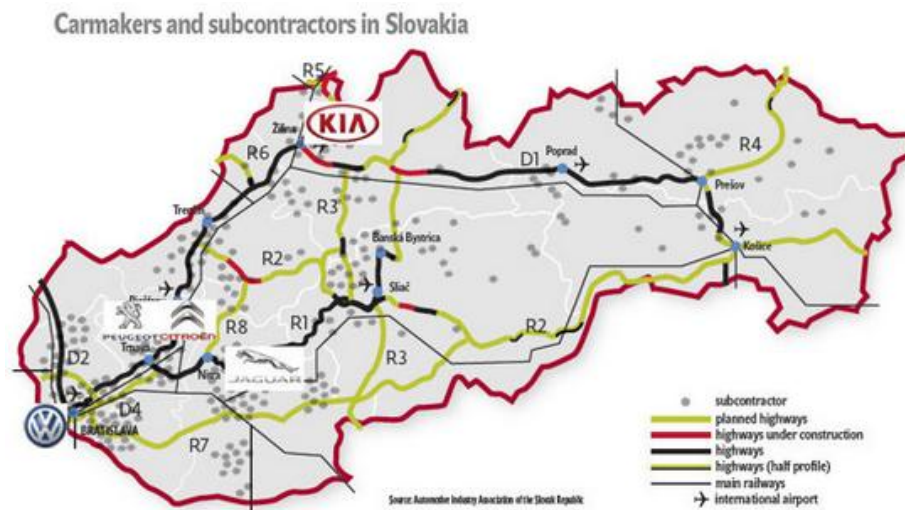


Figure 7: Geographic spread of carmakers and subcontractors in Slovakia

The second major investment came in 2003, the largest Greenfield investment in the Slovak Automotive Industry at that time. France's Peugeot Citroen (PSA) would make a decision to invest in Trnava with investment plans of €700million. PSA Trnava Plant would start production in 2006 although the official opening was in October of 2009. The production got off to good start and although it did go through a slowdown during 2010/11, it would bounce back and continue to increase production numbers from 52,000 cars in 2006 to 303,025 cars in 2015.

The Automotive Industry received another spark when Slovakia was able to attract another major manufacturer. In 2004, KIA decided to invest in Zilina and this would be the only European factory for KIA motors. The investment would reach 1 billion in plant of 161 hectares. The last important investment in Slovak Automotive Industry has been the announcement by Jaguar/Land Rover (Tata Group) to build a plant in Nitra, the western part of Slovakia, in December 2015.

The presence of three major automotive players in Slovakia has created abundant conditions for development of sub suppliers and in light of this the Automotive Cluster – West Slovakia has been formed in 2007, to facilitate coordination between companies that provide services for the automotive producers. The Automotive Cluster West Slovakia, founded by City of Trnava and Trnava Municipality Region, was renamed Automotive Cluster Slovakia (ACS) in 2013.

The ACS mission is “*promote the development of subcontractors to the automotive industry*” but also “*focuses on competitiveness at home and abroad*” by bringing together “*peer groupings of industrial enterprises, universities, scientific research institutions and other stakeholders in the private and public sector*”. The European Secretariat Cluster Analysis, through benchmarking approach, recognized the ACS for their dedication in striving for excellence. The benchmarking took place in December 2012 and the Secretariat awarded ACS with Bronze Label Certificate.¹⁵

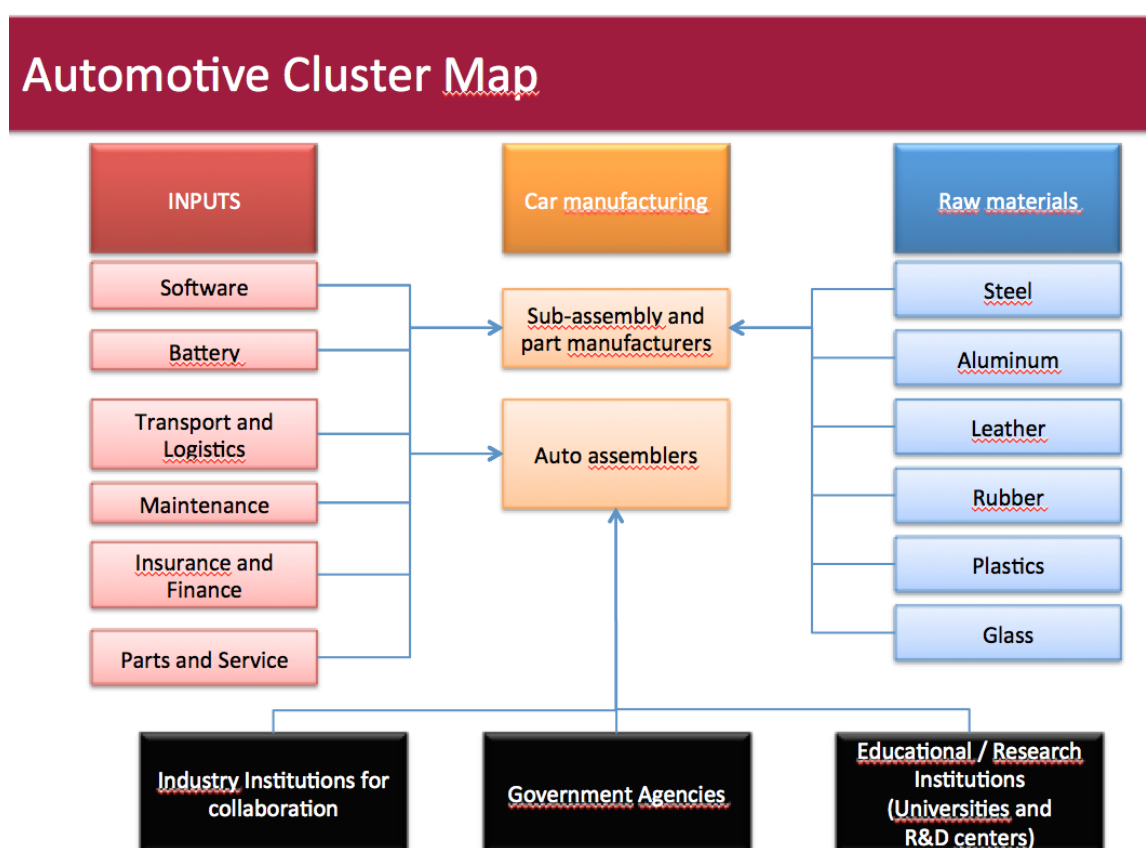


Figure 8: Slovakian Automotive Cluster map

The table above shows important players that interact with the automotive cluster. The cluster has benefited from the Slovak Republic’s highly industrialized metal and chemical sectors (plastic and rubber), which have catered the need for basic inputs for the automotive industries. The Automotive Cluster is now creating an increase in demand especially in subsectors such as

¹⁵ Automotive Cluster Slovakia, <http://www.autoklaster.sk/en>

plastic and rubber. The cluster foundation was advanced through the important role of the Government in attracting the three major automotive companies to Slovakia. Following these investments, an interconnected ecosystem of high quality suppliers has emerged close to major plants. Today more than 300 production plants supply the automotive industry. The cluster has connections with Universities and technical schools such as The Slovak University of Technology in Bratislava, or the Technical University of Košice, in established programs for cooperation with automotive companies to supply the cluster with qualified labor. However, there needs to be further improvement here, as qualified labor has been identified as one of the main obstacles to further cluster growth and development.

Cluster Institutions for collaboration such as Autoklaster Slovakia and ZAP were established to further collaboration between universities and research institutions and industrial enterprises. Their contribution was important in shaping the legislation for attracting further companies but also advocating for competitiveness of the sector however from the interviews with their representatives on the ground it seems that the role of IFC is somehow less clear in the recent years with their main activities being either lobbying or project assistance for EU grants and less focus on the competitiveness of cluster.

Government's pull to attract automotive FDI

All the investments from 2003, 2004 and 2015 have constituted of building new factories on a greenfield by international automotive majors who brought their supplier network with them. Besides a prospective emerging cluster context described above, government incentives played an important role in attracting automotive FDI.

The investment incentive limit is set by the EU (15%). This represents the amount of total amount of incentives that can be granted to foreign investors in the motor vehicle industry. The structure (cash, no-cash) of the incentives is not restricted, however, the final proposal needs to be approved by the EU. All investment incentives, which are considered to provide public goods are taken out of the incentive ceiling. Limits are linked to a specific industry and to economic performance of the region, measured by e.g., unemployment and GDP.

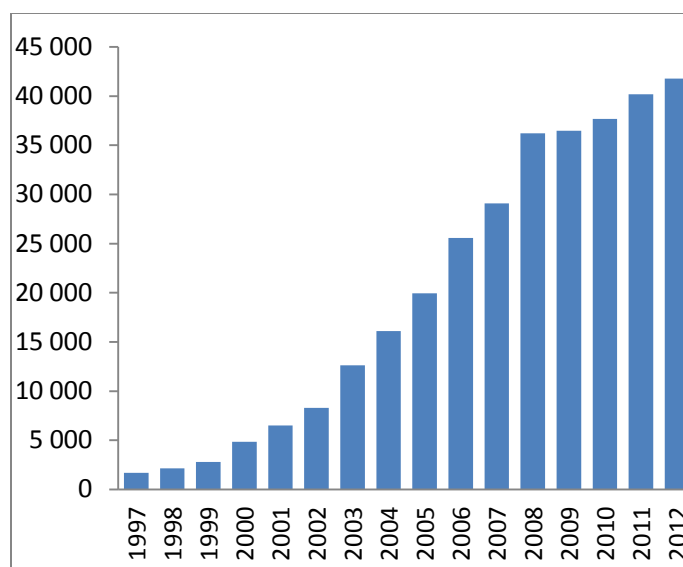


Figure 9: Inwards FDI positions (€ Million)

Having said that, “Slovak ministers wanted to do everything they could to attract the 1st major investor to the country after the new government took over in 1998”.¹⁶ It is understood that Kia was looking for the highest possible state aid on top of favorable country conditions (macroeconomic reforms and stable environment, proximity to markets, and skilled and cost-effective labor). Outside the 15% investment limit, Slovak government dedicated to significantly advance adjacent infrastructure (highway, railway terminal, reconstruction of nearby airport,), to contribute to education incentives (subsidies for re-qualification, support of employers, English language courses for children), to develop housing (complex of luxurious facilities to house the Korean management, stimuli for further property investments), and medical facilities (new hospital)¹⁷. Deeper analysis would be needed to understand whether these incentives were eventually the decision-making factor why investors favored Slovakia over neighboring countries with relatively similar cluster background.

During the various FDI negotiations, other soft aspects played an important role for investors.¹⁸

The Government went “all-in” in terms of being present at key meetings, flexible to amend certain legal restrictions (overcoming relatively worse “Ease of doing business” for the whole

¹⁶ Interview with Peter Kolesar

¹⁷ Peter Kolesar, *Race to the Bottom? The Role of Investment Incentives in Attracting Strategic Automotive Foreign Direct Investment in Central Europe*, 2006

¹⁸ Interview with Slovak negotiators for one of the major automotive FDI and with a major automotive investor

country). The negotiating team was praised for their dedication and make-it-happen attitude, integrity, and willingness to commit to high safety, environment and other standards. The previous investments into industry parks and its relative readiness was also mentioned as one of the beneficial elements.

Cluster performance

Slovakia has achieved a significant growth within the automotive cluster both from external and internal point of view. The country has quadrupled its share of world exports and increased the value of exports by two thirds over the past 15 years. The strong country position in automotive sector (1.6% world share) is even more striking when we compare it to total Slovakia's share on all world exports (0.11%), which is more than 14 times smaller. Domestically, the automotive cluster has strengthened its position as well and forms now more than 25% of all Slovak exports, which is higher by more than a third compared to 2000.¹⁹

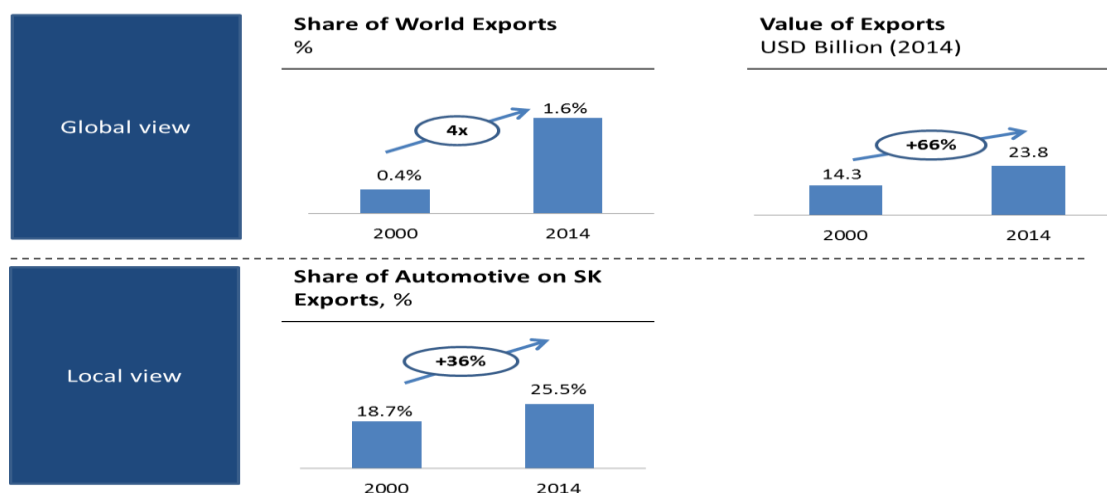


Figure 10: Cluster performance²⁰

The growth in the sector was driven mainly by motor vehicles assembly. The number of cars produced in Slovakia has increased more than five times between 2000 and 2015. Slovakia has

¹⁹ ICCP data on Slovak and World Exports, 200-2014

²⁰ Source: ICCP data on Slovak and World Exports, 2000-2014

thus become a world leader in car production per capita. Other automotive sub-clusters have developed as well. The metal mills sub-cluster has been built practically from scratch. In 2000, Slovakia contributed mere 0.1% to the world share of exports, while in 2014 the country overtook established country players by reaching 16% export share. Automotive parts and engines improved its world-position as well, though comparatively less. This trend is expected to continue given the fact that Jaguar Land Rover will add up to 20-30% production capacity starting in 2018.

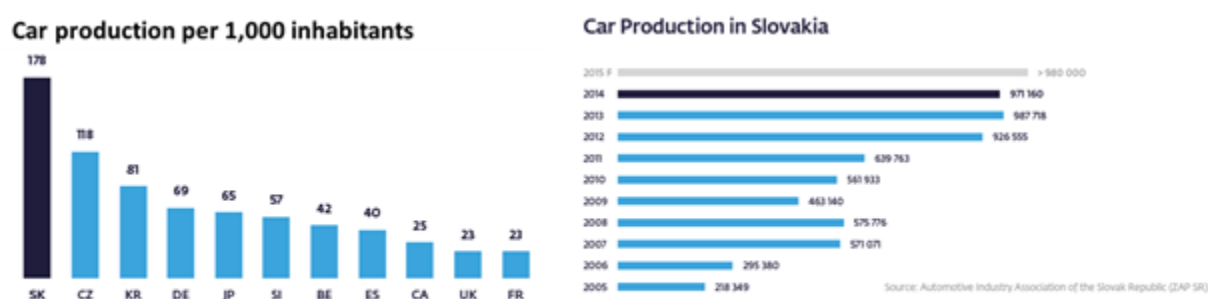


Figure : Car production numbers

Productivity spill-over to local suppliers and adjacent clusters

OEMs exercise significant pressure on their suppliers to achieve lower cost and higher quality, enable access to better product inputs or technology support, and thus motivate productivity improvements. Automotive industry has high propensity for linkages.²¹ Thus, many believe that automotive cluster has a potential to be the engine of innovations in Slovakia with OEMs playing an accelerator role.²² When the major car manufacturers entered the Slovak market, most brought own network of sub-contractors. Therefore, when we evaluate the largest domestically located suppliers, 96% of revenues are from foreign-owned players. These multinational companies have R&D capabilities usually in their mother countries, which limits local innovation potential. Still, there are currently 23 Slovak sub-contractors doing R&D, all linked to OEMs.²³ Most of the innovations are within the domain of process improvements, and product innovations are

²¹ Peter Kolesar, Race to the Bottom? The Role of Investment Incentives in Attracting Strategic Automotive Foreign Direct Investment in Central Europe, 2006, p. 25

²² Smart Industry Conference, March 14th 2016, Automotive panel.

²³ Smart Industry Conference, March 14th 2016, Automotive panel.

limited.²⁴ One of the best case example is CEIT, a spin-off of a large group of PhD students from a local university, who provide productivity efficiency improvement systems, mainly in the domain of digital factories.

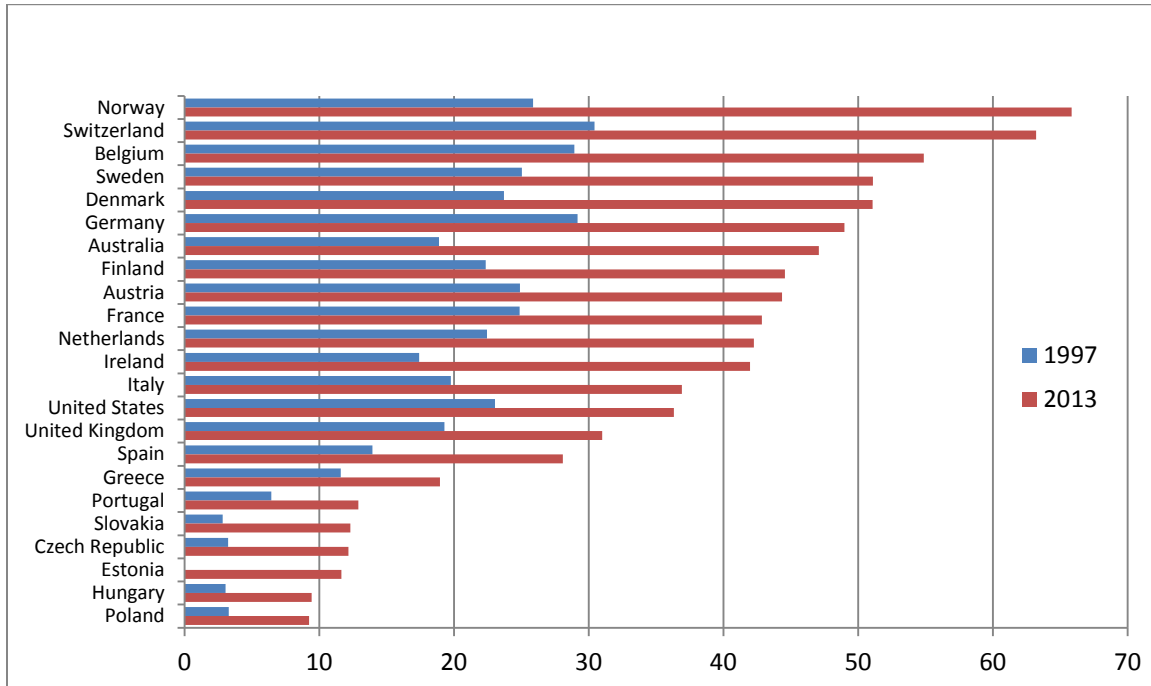


Figure 11: Hourly Compensation costs in manufacturing

Graph is based on 40 largest suppliers in the automotive sector located in Slovakia, whose total revenue was ~EUR 10.3 million in 2014

²⁴ Interview with Peter Kolesar

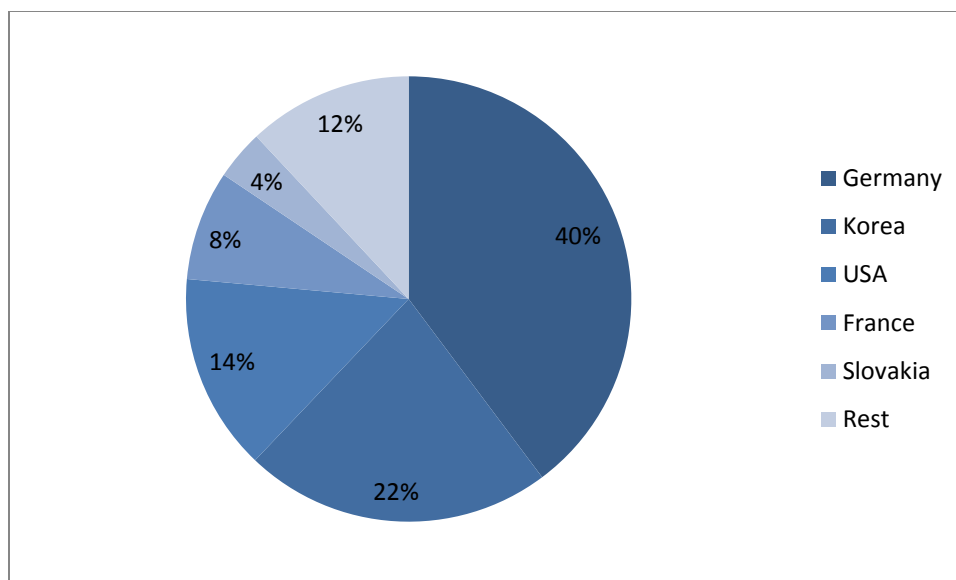


Figure 12: Share of automotive supplier revenues based on companies' country of origin²⁵

The productivity spill-over must have directly or indirectly affected clusters related to the automotive cluster as well. The most adjacent clusters – production technology and downstream metal manufacturing have been gaining world market share since 2000. Nowadays, Slovakia's share in these clusters is five times its total world market share.

When thinking about future possible spill-overs to adjacent clusters, Slovakia can consider the attached map of its performance across related clusters. The Automatic Transportation System (ATS), developed by Prof. Sitar, can bridge four clusters – IT, transportation and logistics, production technology and automotive.

²⁵ Source: <http://www.sario.sk/sites/default/files/data/sario-automotive-sector-in-slovakia-09-2015.pdf>

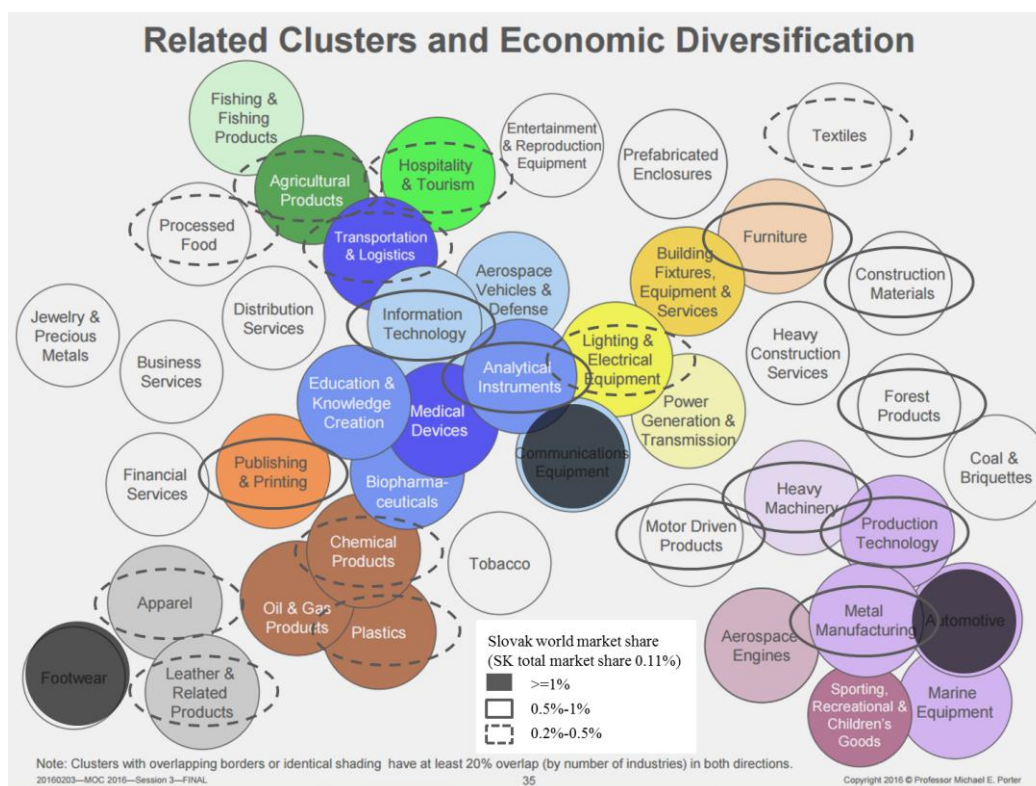
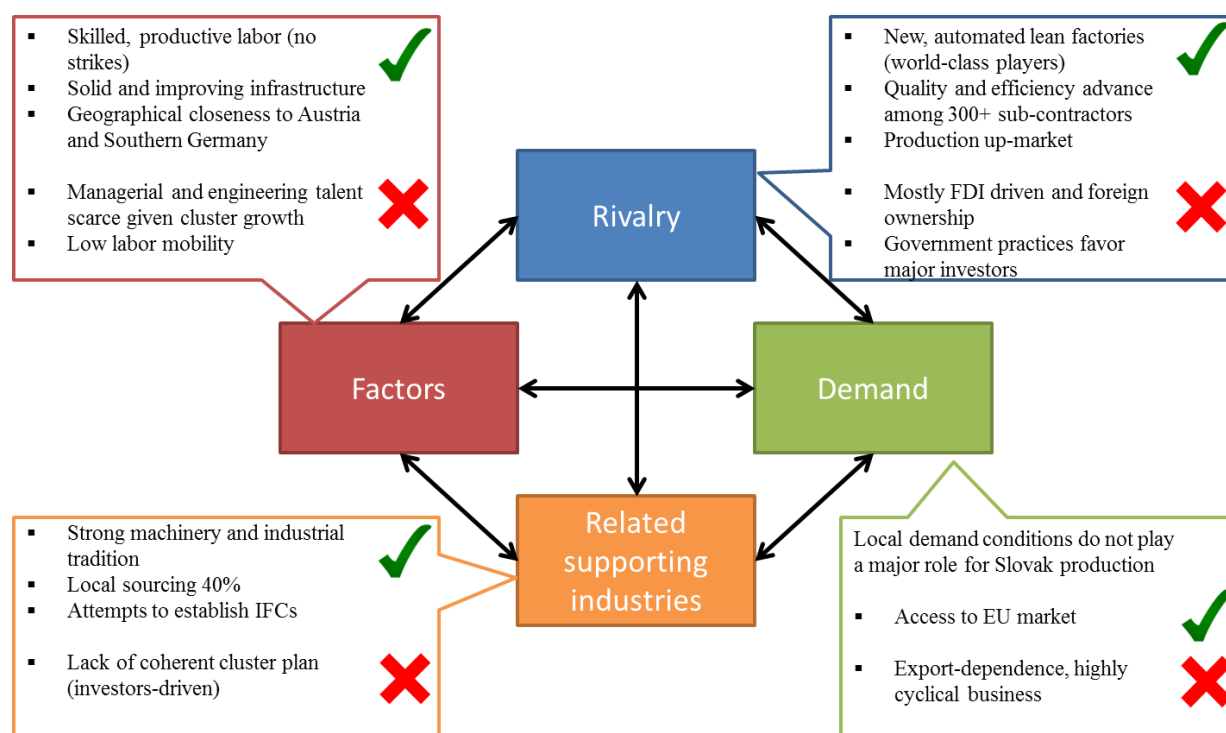


Figure 13: Comparatively strong Slovak clusters in relation to the country's world export market share²⁶

Cluster diamond



Factor conditions

Skilled and productive labor is one of the key assets for the automotive cluster in Slovakia. Employees come from 5 technical engineering universities and 100+ vocational schools²⁷. On the top, the government launched a new dual education programs complementing theoretical and on-the-job training in 2015, which was positively welcomed by the industry. Wages are lower compared to the Western European countries and also among the lowest in the region as well, which match the outsourcing trend of German and French manufacturers. Slovakian working culture has also significantly lower occurrence of strikes and lockouts, especially compared to Poland and Hungary²⁸. On the top, the government is providing significant incentives for companies to re-qualify unemployed part of the population.

Slovakia, especially the Western part of the country where majority of the OEMs are located, has **solid and improving infrastructure** (highways and railways). Its geographical position, particularly closeness to Austria and Southern Germany, provide good connections to the Western markets for both sourcing and exports. Government seems to have been dedicated to improving infrastructure in the business development areas further. It focuses on development of industrial park infrastructure, consolidating land rights, preparing the premises, and advancing the adjacent transportation systems.

EU membership, Euro currency, and thus transparent laws, legal procedures and investors' protection contribute to a large degree to attracting investments.

Having said that labor quality and quantity has been one of the biggest assets, it has also been facing limitations. 78% of the automotive suppliers in the country perceive that a lack of skilled labor force may hinder their growth going forward²⁹. Managerial and engineering talent is considered to be scarce given the rapid cluster growth. Labor flexibility, especially mobility between the Eastern and Western parts, is relatively low. Moreover, the dual education system

²⁷ <http://www.sario.sk/sites/default/files/data/sario-automotive-sector-in-slovakia-09-2015.pdf>

²⁸ Slovakia experienced only 9 lockouts and strikes during 1994-2005 period compared to 1,574 in Poland and 77 in Hungary. World Bank, The Automotive Industry in the Slovak Republic: Recent Developments and Impact on Growth, p. 23.

²⁹ Automotive Suppliers Survey, Slovakia 2015. <https://www.pwc.com/sk/en/odvetvia/automobilovy-priemysel/assets/automotive-suppliers-survey-2015.pdf>

has been implemented only relatively recently and most of the companies are not yet ready to participate in it.

Rivalry

The high level of rivalry in automotive industry in general, and particularly in Slovakia has a very positive effect on the cluster performance development. When automotive world-class players entered the Slovak market, they brought new, **lean factories with high level of automation** set up for just-in-time delivery given both the cost and performance pressures in the sector.³⁰ The three major car manufacturing concerns run internal competitions among individual plants in respect to effectivity, productivity, quality, environmental impact and social responsibility. The local production facilities regularly rank on the top places of these competitions.³¹

The active and rival network of 300+ sub-contractors³² also contributes to **quality and efficiency improvements**. The international OEMs set high bars for adherence to work standards across material handling, product features, safety and environmental practices and for continuous improvement of processes. Local suppliers sell outputs to different OEMs in most cases, so the rivalry dynamics goes both ways. With new market entrants, rivalry increases even for the labor market, which consequently motivates companies to improve production and systems even more to stay competitive. Moreover, suppliers are concentrated in relatively small geographic proximity, which intensifies push for cooperation, which may come in the form of conferences, trade shows, or joint promotion of the industry vis-à-vis talent. The virtuous improvement cycle was one of the drivers of up-market movement of product scale. VW invested into enhancement of facilities to produce Audi and Porsche models locally, and now Jaguar Land Rover followed with upscale, more technologically advanced models.

Growth of automotive cluster in Slovakia has been **driven mainly by FDI**. This represents a challenge for the country. First, the international investors rely heavily on approved suppliers.

³⁰ Peter Kolesar, Race to the Bottom? The Role of Investment Incentives in Attracting Strategic Automotive Foreign Direct Investment in Central Europe, 2006, p. 25

³¹ Interview with Jan Pribula, CEO of ZAP

³² P.6, <http://www.sario.sk/sites/default/files/data/sario-automotive-sector-in-slovakia-09-2015.pdf>

Thus, out of the top 40 largest **suppliers** on Slovak-soil in the Automotive Sector based on revenues, **only two have a local country of origin** (a steel mill, #13 and a parts manufacturer #34³³). As described in the cluster performance part, there is some productivity spill-over, however, it is limited. Second, **government** seeking further growth can react **rather opportunistically**, and its practices may **favor major investors**. It seems to be the case that FDI players have a major say over the development of the cluster and the rules are being bent for them, legislation amended and processes speeded up. At the same time, ease of doing business for local small and medium business remain cumbersome, especially compared to the region. This approach may eventually hinder competitive environment.

Related supporting industries

Strong machinery and industrial tradition have supported the development of the cluster as described in the cluster map segment. **Local sourcing** of components that go to local production is strong and represents **40% of total**. At the same time, suppliers present in Slovakia produce ~40% of output for domestic market and export ~60%.³⁴ Main reason for the two-way sourcing strategy is rooted in logistical efficiency and utilization of trucks.

Local related industries are heavily skewed towards production, and are very light on research and development. R&D facilities are mainly concentrated in the mother company headquarters' locations. Some local successes were described before; however, if the cluster wants to develop further, this is an unrealized opportunity.

We also believe that for the moment there is a **lack of coherent cluster development plan**, especially from the government side. So far, the government has acted relatively opportunistically in attracting investors. After the financial crisis, which affected global car demand and thus impacted heavily Slovak exports, the government proclaimed that the country will pro-actively focus on diversification of too focused industries, automotive being one of them. However, we have seen further consolidation of the cluster value, which will only increase

³³ Analysis based on P. 10 and <http://www.sario.sk/sites/default/files/data/sario-automotive-sector-in-slovakia-09-2015.pdf>

³⁴ Interview with Jan Pribula, CEO of ZAP.

once Jaguar Land Rover starts its production. Government is more reactive and does not shape the cluster future. New initiatives, such as Smart Industry, are starting to be discussed.

Demand

Given the fact that automotive **demand and supply** are to a large degree **globalized**, the local demand conditions do not play a major role when selecting a plant location. Slovakia definitely benefits from being part of the EU, and from having a duty-free access to a half a billion people European market. Having said that, large customer share of the more expensive car types, especially for the newly coming player, is located outside the EU. The demand is thus dependent on exports, highly cyclical, and difficult to influence.

Competing clusters

The EU was the first vehicle manufacturer in the world, but has been surpassed in recent years by China. The automotive industry is crucial for Europe's prosperity. The sector provides jobs for 12 million people and accounts for 4% of the EU's GDP. There are 2,3 million high-skilled jobs in the automotive manufacturing sector which represent 7.6% of the EU's manufacturing employment. Unfortunately 60% of European car manufacturers are operating below 75% of their capacities - the generally accepted profitability level. The total car manufacturing capacity in the EU is 20 million vehicles a year but demand in 2013 amounted only to 14 million.³⁵ See Exhibit 1 for comparison figures.

Germany³⁶

Germany is world renowned for the premium quality of its engineered products. The country has been a pioneer in the automotive industry with Carl Benz inventing the first car at the end of the 19th century. At the beginning of the 20th century FDI flowed into the country mainly from the US. In the 1990s, German reunification opened a new domestic market and production opportunities.

³⁵ http://www.enterprisecanadanetwork.ca/_uploads/resources/A-Study-on-the-Hungarian-Automotive-Industry.pdf

³⁶ Baden_Wuerttemberg_Automobile_Cluster 2015 – Harvard Business School, MOC student paper

Germany has the 5th largest economy in the world with a stable macroeconomic environment and an aging population. The automotive cluster is one of the largest and most important sectors in Germany contributing around 20% of total German industry revenue in 2013. The sector accounts for over 30% of all passenger cars in the world and comprises some of the world's strongest brands (Mercedes, BMW, Porsche, Audi, etc.). The cluster produces 3.5 million more units than the next closest European competitor, Europe counting for 50% of Germany's largest export market followed by the United Kingdom and the United States at 17 and 15%, respectively.³⁷

The German state Baden Württemberg has historically spent more money on R&D than the German average (3.5% vs. 3%) and several other countries such as Japan and the United States. Studies show that Baden-Württemberg is one of the most innovative regions in Europe and the world. Germany has kept high-value R&D jobs, while outsourcing lower value. Both Germany and France have contributed to an R&D spillover to neighboring countries in the EU (training and projects) but overall R&D is kept as home.

The Czech Republic³⁸

The Czech Republic is the fifth-largest car producer in the EU and the 13th largest worldwide (OICA). The automotive industry is a powerful engine of the Czech economy with 20.2% of manufacturing output, 20.2% of Czech exports (2007), and over 120,000 employees. In 2014 the sector accounted for 21.3% of total industrial output and 20.1% of exports.

The Czech Republic has had a long tradition in the automotive industry. The country started making cars in 1905. Its own brand – Skoda – was built during the communist period, and was acquired by VW in 1991 to become the company's fourth largest brand. The country has two other world auto players: Toyota and PSA built a plant and started production in 2005 while Hyundai built a plant in 2005 (one year after the company invested in a sister plant in Slovakia).

³⁷ Baden_Wuerttemberg_Automobile_Cluster 2015 – Harvard Business School, MOC student paper

³⁸ http://www.mzv.cz/file/672401/brochure_czech_automotive_industry.pdf

Among CZ's competitive advantages are the country's physical proximity to Germany, its flexible, hardworking and highly skilled labor force, high levels of technical education, median wage levels for the EU, state-of-the-art technology and highly competitive factories. CZ enjoyed the highest productivity growth in 2003 – 2011 (highest average annual growth (%) of real GDP per hour worked) in this peer group – higher than Germany, Austria or France.

The country has had a highly involved and committed government and strong industry associations, which together worked to build an extensive and robust value chain and strong ties with neighboring partners (Slovakia). The Czech Republic has been attracting FDI through component manufacturers: German, French, Asian and US investors. European Investment - Monitoring teams from Ernst & Young ranked the Czech Republic as the world's leading location for automotive-component plants for three consecutive years.

Poland³⁹

Major international companies with significant presence in the Polish automotive sector include Fiat, Opel, Toyota, Volkswagen, MAN Nutzfahrzeuge, Solaris, Volvo and Scania AB.[9] Out of those, historically Fiat had a very strong presence in Poland for almost a century. For the period 2007-2009, Poland was the second largest producer of passenger cars in Central and Eastern Europe, after the Czech Republic (and not counting Russia). Most of the sector's output is geared for exports, primarily to the European Union.

The automotive sector is Poland's second largest by turnover, employing about 170,000 people. Automotive output constitutes almost 10% of industrial production. In recent years Poland has been losing ground to neighboring Czech Republic and Slovakia as a regional automotive manufacturing hub. Since 2010, the number of cars made in Poland has been decreasing from 869,376 to 583,258 in 2013.

Hungary^{40,41}

³⁹ EIU – Automotive Industry Country report

⁴⁰ <http://www.invest-export.irisnet.be/documents/16349/24447/Automotive+industry+in+Hungary.pdf/cc70f051-d2cd-4fdf-a68c-6e5f3117e7fd>

⁴¹ http://www.pwc.com/hu/en/publications/investing-in-hungary/leading_sector_automotive.html

Hungary's history in the automotive industry started in the 19th century, as part of the Austro-Hungarian Empire. As is the case with the majority of Central and Eastern European countries, Hungary does not have a nationally owned car brand. The companies that dominate the automotive landscape in Hungary are Suzuki, Opel (General Motors), Skoda (Volkswagen group) and Ford, all foreign-owned domestic manufacturers. Following five consecutive years of contraction, automotive production returned to growth in 2011-12 and has been expanding healthily since, driving industrial output growth and exports.

Romania⁴²

Romania is the 11th-largest in the EU and the fifth-largest vehicle producer in East-Central Europe, after the Czech Republic, Slovakia, Poland and Hungary. Unlike its neighbors who also produce a lot of auto parts, Romania's output consists almost entirely of cars, which are produced by Renault (Dacia) and Ford US. Romania has four car assembly and engine production plants, compared with 16 in Poland, 11 in the Czech Republic and three in Slovakia.

Recommendations

Priority National Level Recommendations

Enhancing transportation infrastructure and strengthening the business climate (improvements to the legal and procurement systems) could encourage investment in weaker regions, and together with **reforms to promote rental housing** (phasing out support for home ownership, expanding means-tested rental allowances, and easing regulations that discourage owners from renting), would promote labor mobility.

Lowering the labor tax wedge, especially for low-wage or part-time workers, would foster labor force participation and help reduce disincentives to hiring. In this spirit, the reduction in the health contribution allowance to offset the impact of the minimum wage increase in early 2015 was welcome.

⁴² EIU – Automotive Industry Country report

Priority Cluster Level Recommendations⁴³⁴⁴⁴⁵

Strengthening education and training would allay skill shortages, which are becoming more binding. Effective implementation of the recently launched dual vocational education system is essential to help meet labor market needs. On the job training should be prioritized.

Devise a program for Slovaks to receive industry specific higher education and/or trainings abroad for management level, as managers are more likely to start related businesses and see them succeed.

Promotion of R&D investment through increasing deductible R&D tax benefits to levels common in the CEE region and establishing a National Technology Institute for collaboration between local suppliers and research institutions.

Creating **specific funding vehicles for industrial startups**, through the existing industrial park structures, but also elsewhere, in order to enable the creation of new industries related to the automotive knowhow already in the country. Automotive labor and knowhow could and should be incentivized to initiate related product lines (motorcycles, gardening machines, other types of engines etc.).

Increase quality of facilities close to the large factories, customs, tax administration, licensing and public institutions, extending these services to local suppliers, especially new ones that can supplant imports to the industry. Ensure access to finances for the local suppliers, through partial funding of interests on loans, or other schemes.

IFC's are experiencing budgeting constraints as their only revenues are from members, while no assistance is extended by the Government. Efforts to **support the IFC's through public funding or grants** would directly benefit the cluster to promote innovation, linkages, technological training and brand building. Through our interviews in the ground, IFC's have clearly stated their interest to be involved in requalification and dual vocational system as well as

⁴³ PwC, ZAP, SAI, Automotive Suppliers Survey, Slovakia 2015

<http://www.pwc.com/sk/en/odvetvia/automobilovy-priemysel/assets/automotive-suppliers-survey-2015.pdf>

⁴⁴ Strategy&, Automotive Perspective 2015

<http://www.strategyand.pwc.com/media/file/Automotive-perspective-2015.pdf>

⁴⁵ Markianidou, Paresa, et al, "Cross-sectoral Trends and Geographic Patterns in 'Mobility Industries'" European Cluster Observatory REPORT 2014 (http://ec.europa.eu/growth/smes/cluster/observatory/european-cluster-trend-report/index_en.htm)

innovation and R&D, but presently support from Slovakian Institutions is very weak. We see an opening to increase the role of IFCs through government grants that could be tied to competitiveness goals and promotions of new technology.

Electronic content in cars is increasing and it is expected to grow from 25% in 2015 to 45% in 2025. Almost 90% of current innovation in the automotive industry is in the electronic field. As the Automotive electronics industry is emerging, Slovakia has no clear plan to adapt to this opportunity, and **forge new cross sector collaboration**, which in turn would affect other industries.⁴⁶

Confronted with the emergence of use of lighter materials and alloys in the industry, which would influence the chemical and steel industries, **the government should assist through IFCs in the creation of conditions that will facilitate these trends**, and enable Slovakia to modernize its industry faster than its regional peers.

Set up a specialized **team to do an in depth analysis of the industry**, including SWOT analysis, that it can translate into policy suggestions for helping the industry, and creating larger ripple effects for the economy.

⁴⁶ Izsak Kincsó, et al. “*European Cluster Trends*” European Cluster Observatory REPORT March 2015

http://ec.europa.eu/growth/smes/cluster/observatory/european-cluster-trend-report/index_en.htm