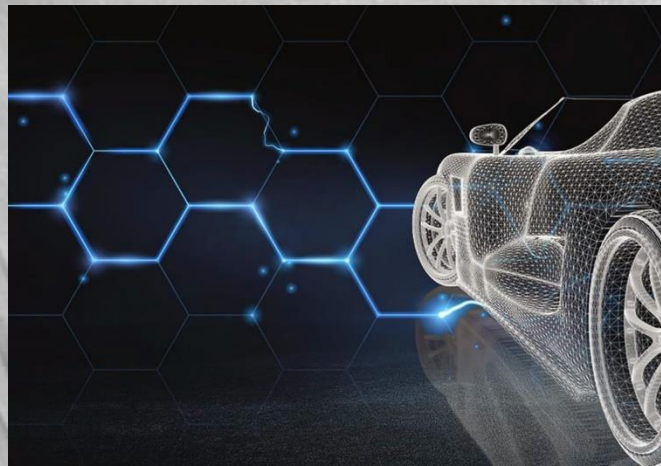


# *Added value in the Slovak automotive sector – **Challenges and Policy Recommendations***



Assoc. Prof. Stanislav Zábojník, PhD.  
Head of the Department of  
International Trade, Faculty of Commerce EUBA

• Visegrad Fund

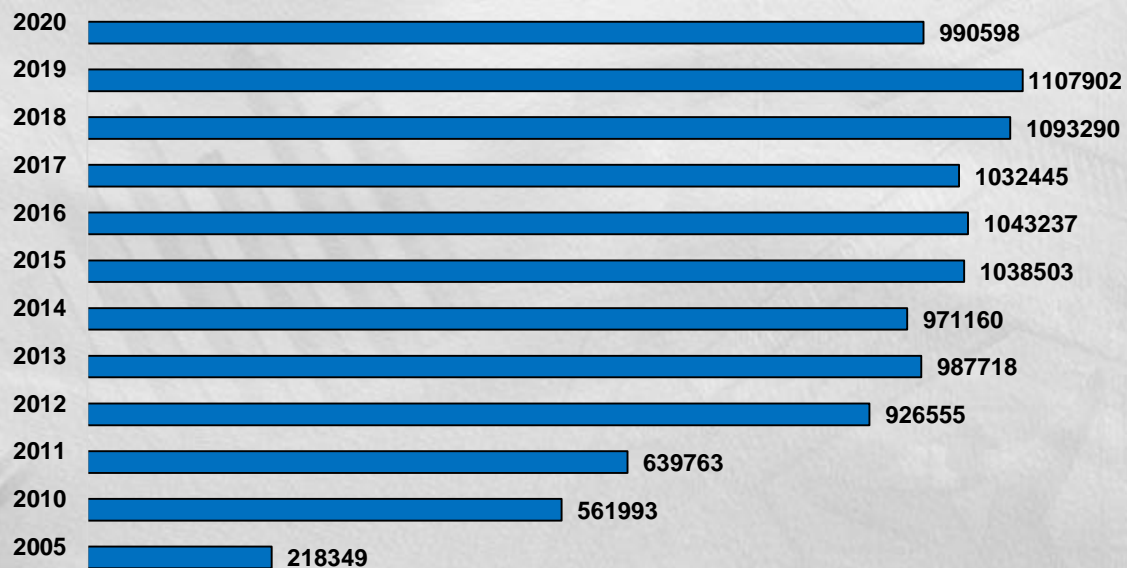
# Structure of the presentation

1. Brief overview of the modern automotive in Slovakia
2. SWOT and comparison to other V4 countries
3. Contemporary trends and challenges in the automotive industry
4. Policy recommendations





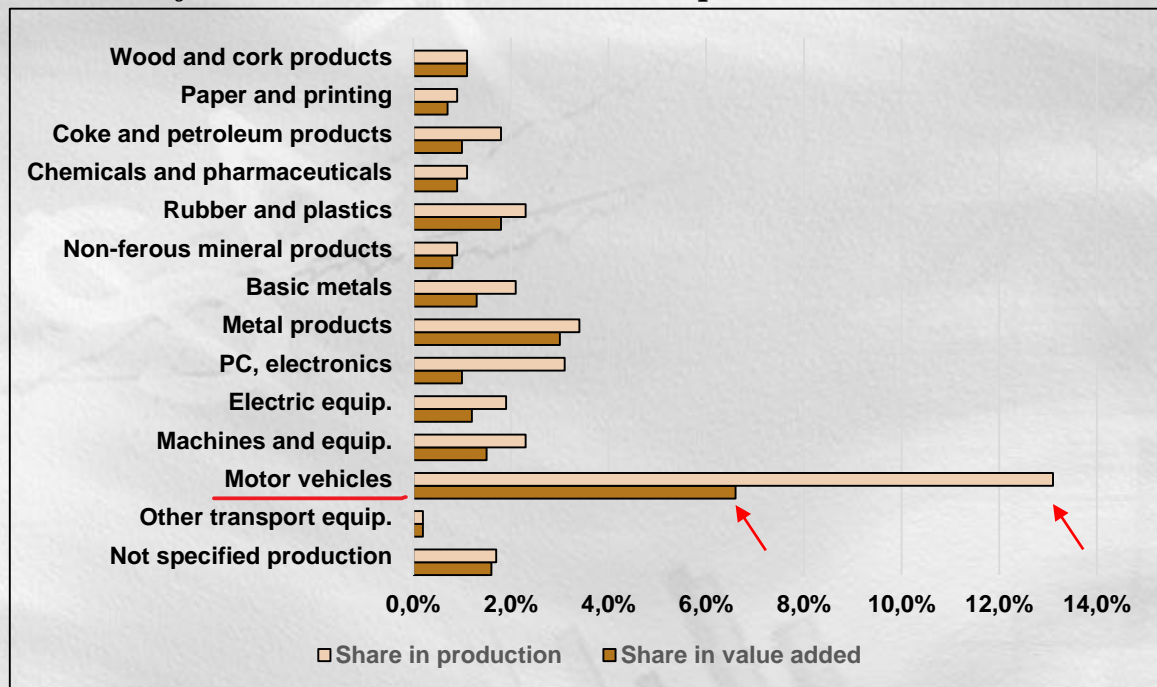
### *Car production in Slovakia*



SARIO (2022)



## The share of individual industries in the total production and value added created in Slovakia



PreĽo (2019)

## Value added of the largest car manufacturers in Slovakia

Name of the company	in mil. €	2016	2017	2018
Volkswagen Slovakia, a.s.	Production	7 586.6	7 549.1	10 380.0
	Intermediate consumption	6 739.4	6 615.2	9 201.6
	Added Value	846.9	933.8	1 178.4
	Share of added value on production →	11.2%	12.4%	11.4%
Kia Motors Slovakia, s.r.o.	Production	5 566.2	5 184.7	5 185.6
	Intermediate consumption	4 782.2	4 369.5	4 643.3
	Added Value	784.0	815.2	542.4
	Share of added value on production →	14.1%	15.7%	10.5%
PCA Slovakia, s.r.o. (Stellantis)	Production	2 464.8	2 664.5	2 752.8
	Intermediate consumption	2 349.2	2 510.2	2 616.1
	Added Value	115.6	154.3	136.7
	Share of added value on production →	4.7%	5.8%	5.0%

# SWOT of V4 automotive and Slovakia - comparison

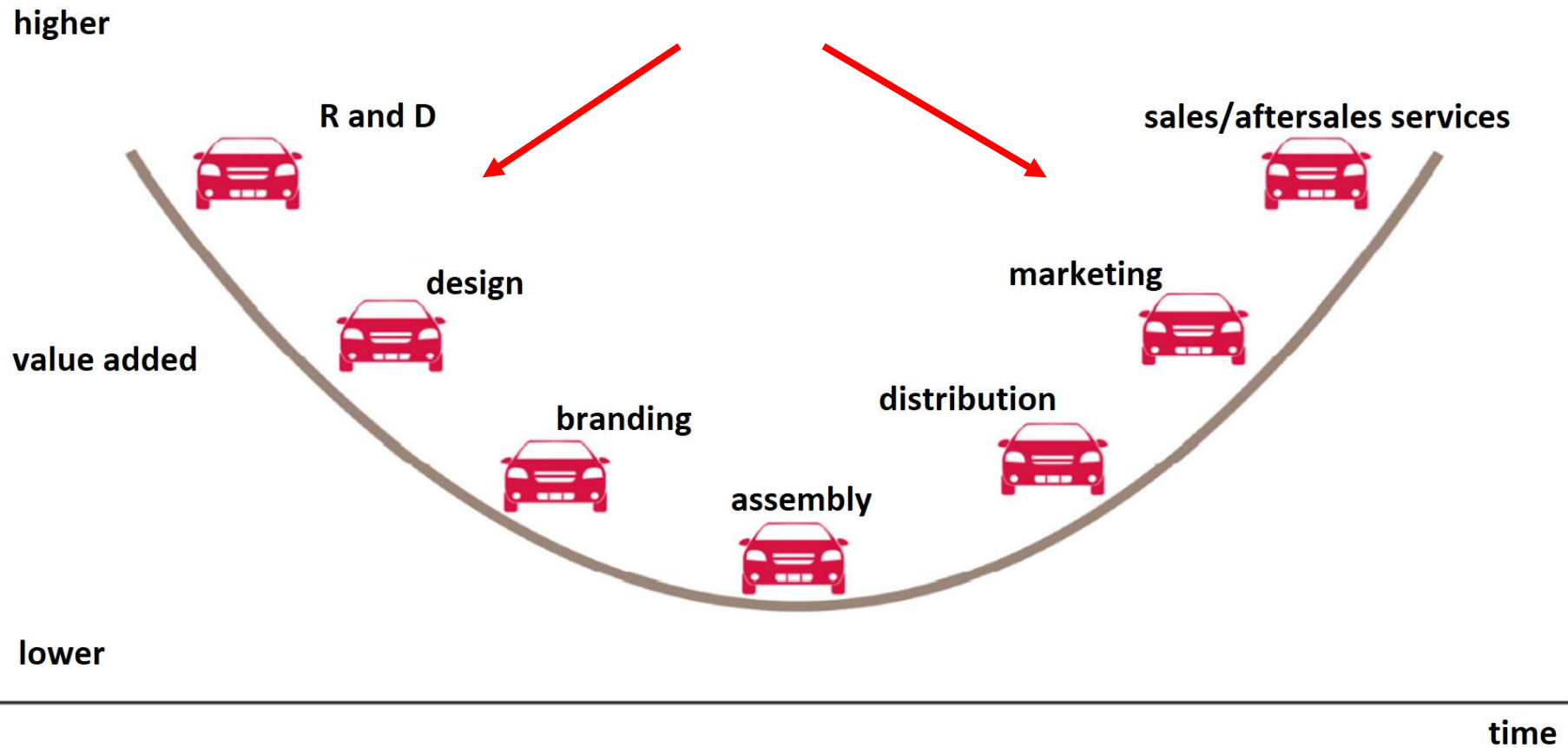
Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• <b>Geographic location</b></li> <li>• Historical traditions in the automotive industry and mechanical production</li> <li>• <b>Established position in suppliers' networks</b></li> <li>• Low labour costs (PL, HU) and high productivity rate</li> <li>• High rewards (PL, CZ, SK)</li> <li>• Production capacity (CZ, PL)</li> <li>• <b>Strong position of the V-4 countries in their value chains</b></li> <li>• <b>High rates of participation in GVCs</b></li> <li>• High forward linkages in "motor vehicles" (CZ, HU, SK)</li> <li>• Membership in the EU</li> </ul>	<ul style="list-style-type: none"> <li>• <b>High reliance on the EU as an export market</b></li> <li>• Relatively high focus on ICE-powered vehicles production</li> <li>• <b>High foreign ownership and control</b></li> <li>• Low share (except PL) and <b>decreasing domestic value added</b></li> <li>• Noticeable interdependence between macroeconomic situation and automotive sector performance</li> <li>• Low ratio of forward to backward linkages</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• <b>Setting up gigafactories for EV battery production</b></li> <li>• <b>Closer cooperation with technical universities and research institutes</b></li> <li>• <b>R&amp;D centres establishment</b></li> <li>• Low business operations risk</li> <li>• Automation and robotization</li> <li>• Involvement of immigrants from Ukraine as a workforce</li> <li>• <b>Perspective on non-EU export markets</b></li> <li>• Growing integration with global production networks</li> <li>• Displacement of some production facilities from Asia and Russia</li> <li>• Lasting state subsidies and government investment incentives policy</li> </ul>	<ul style="list-style-type: none"> <li>• Labour force shortage</li> <li>• <b>Supply chain disruptions due to raw materials shortage (rare earths, semiconductors)</b></li> <li>• Future infectious diseases or pandemic</li> <li>• Middle-income trap</li> <li>• Russian invasion to Ukraine and risk of spilling it across borders to V-4</li> <li>• Political instability or conflicts in Asia</li> <li>• Green deal and 'Fit for 55' putting an end to the production of ICE-powered and hybrid vehicles</li> <li>• <b>Inflation and economic recession as a result of primarily COVID-19 and Russian invasion</b></li> <li>• <b>Energy security and energy costs in the EU</b></li> <li>• <b>Insufficient number of specialists, especially STEM (HU, SK)</b></li> <li>• <b>Low investments in R&amp;D, especially GERD (government expenditure on R&amp;D)</b></li> <li>• <b>Sustainability of key foreign automotive investors</b></li> <li>• A mismatch between the V-4 supply and EU demand in terms of the EV market</li> <li>• <b>Non-participation in the euro area (CZ, HU, PL)</b></li> <li>• Competition from Asian automotive producers</li> <li>• Disorganization in transportation as a result of lack of containers and the rising cost of transportation</li> </ul>

Share of Foreign Added Value on Gross Export (total)												
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Slovakia</b>	43,0	46,5	46,1	45,1	41,9	43,9	46,7	46,6	46,8	45,9	44,8	44,5
<b>Hungary</b>	44,0	46,2	45,9	46,7	43,5	47,5	47,8	47,0	46,1	46,0	43,1	44,1
<b>Czechia</b>	34,4	35,6	36,3	35,5	33,3	37,2	38,7	39,3	38,9	39,7	39,3	37,7
<b>Poland</b>	24,7	27,2	27,7	27,8	24,4	26,9	28,4	27,3	27,3	27,5	26,6	26,9
<b>Germany</b>	18,6	20,4	21,1	21,4	18,1	21,5	23,2	23,1	22,4	21,7	21,0	20,3
<b>Austria</b>	25,5	26,5	26,6	27,2	23,3	28,0	29,7	29,9	29,5	28,7	26,5	26,6
<b>UK</b>	14,3	15,0	14,9	16,6	15,9	17,5	18,8	18,8	18,0	16,3	15,1	15,4
<b>EU 13</b>	32,9	34,8	35,0	35,0	31,8	34,7	36,2	35,9	35,2	35,0	33,9	33,3
<b>EU28</b>	22,1	23,8	24,3	25,3	22,3	25,0	26,5	26,7	26,0	25,6	24,6	24,3
<b>USA</b>	10,8	11,4	11,7	12,9	9,4	11,1	12,7	12,4	11,5	11,2	9,5	9,0
<b>China</b>	26,3	25,9	24,8	23,0	19,5	21,1	21,7	20,8	20,4	19,5	17,3	16,7
<b>Japan</b>	10,2	12,2	13,2	15,2	10,9	12,2	14,3	14,0	15,2	15,8	13,2	11,4
<b>India</b>	18,8	20,6	20,7	24,5	21,8	23,7	25,1	25,1	24,8	23,0	19,1	16,1
<b>Russia</b>	9,9	9,3	9,4	10,4	10,5	9,7	9,4	8,7	8,9	9,4	10,8	10,2
<b>Turkey</b>	15,4	17,5	18,1	19,6	15,7	17,2	19,4	20,5	19,1	18,2	16,8	16,5



Share of Foreign Added Value on Gross Export (automotive)												
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Slovakia</b>	65,6	68,4	66,1	65,2	55,9	57,6	59,7	60,5	60,8	59,4	59,6	59,9
<b>Hungary</b>	55,7	57,6	58,1	60,6	57,2	58,7	61,0	64,4	64,2	64,5	54,4	60,4
<b>Czechia</b>	44,8	45,9	46,4	44,4	42,3	46,1	47,8	49,3	49,2	50,6	54,3	50,5
<b>Poland</b>	40,4	43,4	45,1	43,2	38,7	43,2	43,5	41,9	42,5	42,2	39,3	42,6
<b>Germany</b>	25,4	25,8	26,6	27,2	25,2	27,2	28,1	27,8	26,7	26,3	24,3	25,5
<b>Austria</b>	47,5	48,2	47,1	45,8	39,7	45,4	47,1	45,0	46,5	46,5	41,4	44,6
<b>UK</b>	30,6	31,6	32,8	33,2	32,6	33,3	35,9	35,7	32,3	30,1	29,2	31,0
<b>EU 13</b>	49,1	51,4	52,1	51,4	45,8	48,7	50,2	51,9	52,1	52,7	51,4	52,0
<b>EU28</b>	31,3	32,9	34,1	34,3	30,9	33,0	34,5	34,5	33,6	33,3	31,5	32,7
<b>USA</b>	24,0	24,6	26,7	27,1	25,7	26,1	27,6	26,3	24,6	26,3	23,7	23,8
<b>China</b>	22,0	22,1	22,1	20,3	17,4	19,4	20,7	19,3	19,4	19,3	16,3	15,8
<b>Japan</b>	8,7	10,7	11,5	13,5	9,4	10,8	12,4	11,6	12,9	13,6	12,0	10,4
<b>India</b>	25,3	27,1	28,1	33,2	29,0	32,5	33,9	32,8	33,7	31,3	28,1	23,5
<b>Russia</b>	29,1	29,7	31,0	36,6	29,1	30,3	32,1	31,6	33,2	31,5	30,5	29,1
<b>Turkey</b>	27,9	29,2	29,3	29,8	24,3	27,0	30,4	30,8	30,3	29,6	27,4	26,5

# Value Added – automotive sector



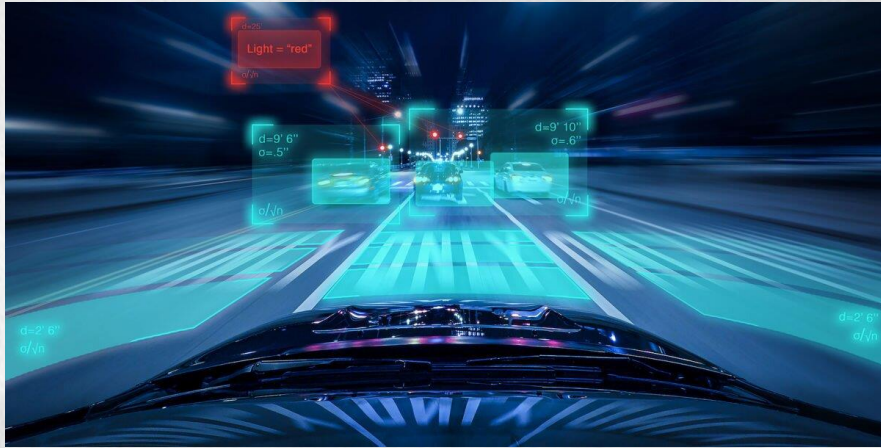


# Where is the Way Out - Transformation of the GVCs

Strategies used by firms, clusters and countries to improve their positions in global and regional value chains (Gereffi, 2019):

- **Process upgrading** - transforms inputs into outputs more efficiently by reorganizing the production system or introducing superior technology,
- **Product upgrading** - moving into more sophisticated product lines,
- **Functional upgrading** - acquiring new functions (or abandoning existing ones) to increase the overall skill content of the activities,
- **Chain upgrading** - entry or diversification into a new value chain by leveraging the knowledge and skills acquired in the current chain.

# Stimulating Innovation Potential is the Key - **ACES**



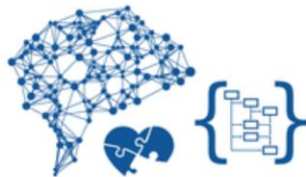


# Essential Skills of the Labour Force

## Top 10 skills

### in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility



### in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity



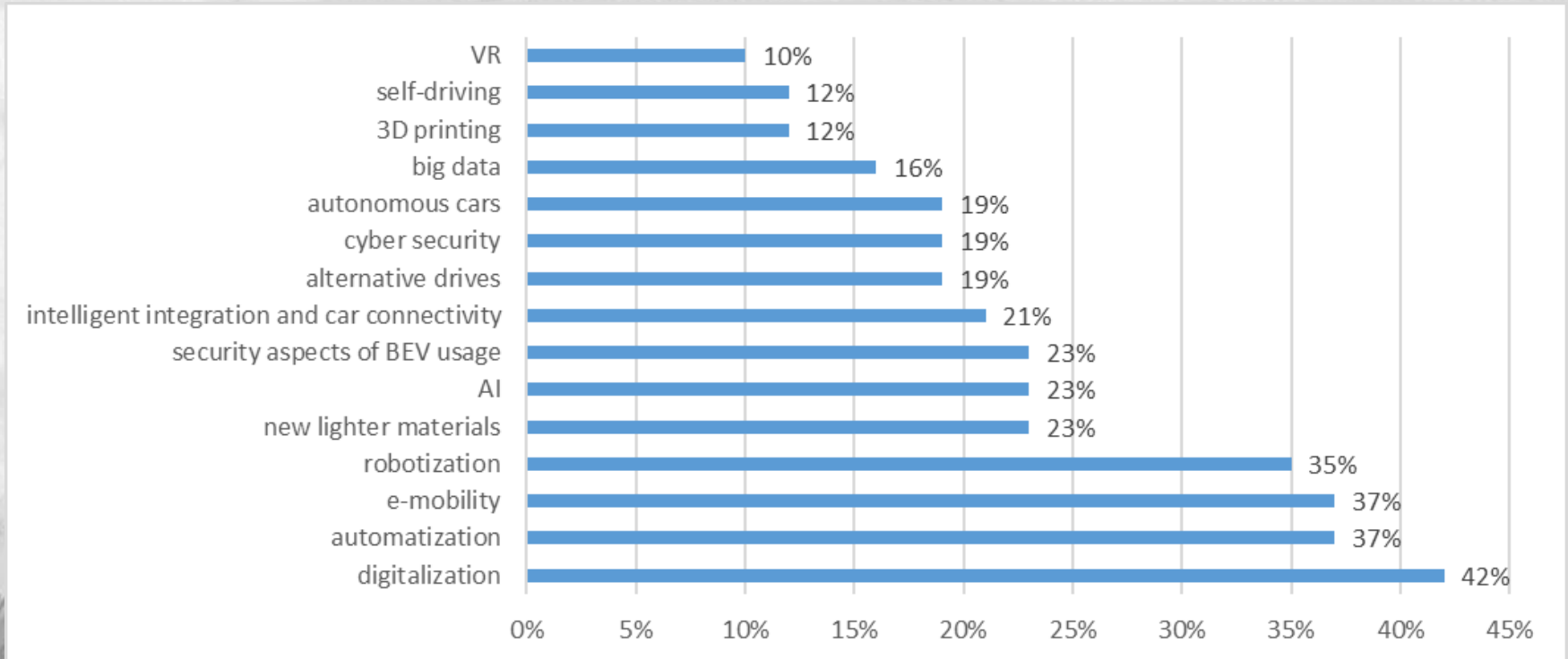
Source: Future of Jobs Report, World Economic Forum



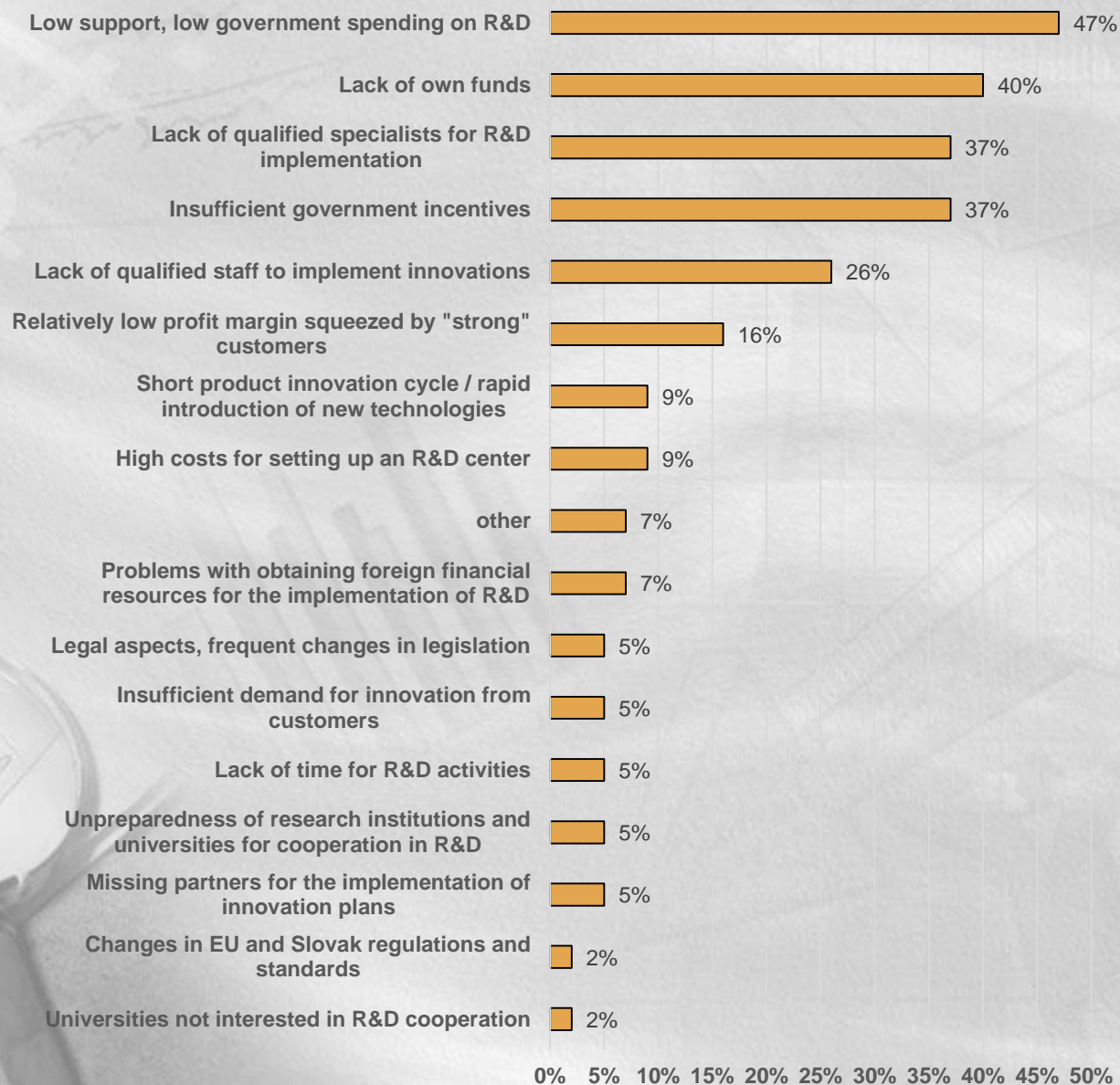
# Expected trends in the Slovak automotive industry (labour force)

Trend	Expected new knowledge and skills	Current jobs most impacted	New jobs needed
<b><i>ADDITIVE TECHNOLOGIES</i></b>	drawings to the 3D printing process, 3D printing principles, 3D software knowledge, structures creation simulations	Industrial production designer	3D operator, 3D laboratory assistant and metrologist
<b><i>AUTOMATION</i></b>	online communication monitoring current traffic, AI usage in traffic, cyber security procedures, methods of automated control system above the vehicle while driving, control tests processing, understanding of the norms, documents, schemes in BEVs and PHEVs	Industrial production designer, quality control, production planning specialist, service advisor in car service	IT specialist in the automotive industry, smart mobility specialist, cyber security specialist, VR prototypes specialist, big data analyst, simulations and VR specialists, test driver
<b><i>E-MOBILITY</i></b>	diagnostic methods and service, batteries and hydrogen knowledge, dynamic charging of BEV, charging optimization, assembly and disassembly of the BEV, processing of the BEVs technical tests data, orientation within the documents and norms of the BEVs		IT automotive specialist, robotization specialist, smart mobility specialist, industrial big data analyst, predictive maintenance system specialist, VR systems specialist
<b><i>SMART TECHNOLOGIES</i></b>	digital technologies and remote production, 5G network usage, digital twin (methods, principles), virtual process/product/training/company, complex virtual picture, production optimization via a digital twin	production planning specialist	IT automotive specialist, robotization specialist, smart mobility specialist, nanotechnologies specialist, industrial big data analyst, predictive maintenance system specialist, VR systems specialist, user experience specialist, digital production engineer, digital biomimetic production specialist

# Expected trends in innovations within 3 years (technologies):



# Barriers for higher innovation activity:





# Recommendations and policy change proposals

## **Labour market and education system:**

- key policies better reflecting the new required positions (jobs) till 2030;
- to carry out Slovak education system changes since assembly and factory workers as job positions very likely to be redundant;
- to develop a concept for employing and retaining a workforce from the third countries.

## **Innovation activity of the automotive suppliers:**

- to anchor the priorities of R&D needs in the legislation related to the automotive industry so that the necessity of adaptation to technological changes as well as the role of Slovakia in GVCs is more accentuated;
- to establish a platform (also fiscal incentives) for cooperation among the automotive sector suppliers and technical universities, and R&D institutes that can promote innovations, spill-overs, and knowledge transfer;
- to create platforms and R&D centres to spread awareness of innovation trends in the automotive industry (primarily e-mobility) and share R&D outputs reasonably.

# Recommendations and policy change proposals

## **Regulation and legislation:**

- to propose specific legislation for better financing and implementation of research activities in the automotive industry controlled by foreign TNCs (R&D) in Slovakia;
- to minimize bureaucracy in the area R&D related costs and to design fiscal incentives for entrepreneurs to motivate them to undertake R&D activities in automotive production;
- to anchor the specific position of domestic universities and research institutions in foreign automotive manufacturers' eyes to boost and deepen the cooperation between OEMs and these institutions in Slovakia.



# Recommendations and policy change proposals

## **Financing of the innovation activities:**

- to propose a specific action plan for financing and expected outputs of the automotive suppliers' innovation activities;
- to strengthen the government funds (GERD), and business spending in automotive innovation (BERD) through public research grants;
- to more efficiently use the framework programs (EU schemes) to support domestic R&D activities.

## **Other:**

- to educate the entrepreneurs and students about GVCs, international production fragmentation and its consequences;
- to propose investment incentives for the batteries and BEVs production in Slovakia;
- to share best practices and success stories in the field of automotive industry innovations;
- to strengthen the export policy promoting Slovak automotive suppliers.