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Possible Challenges for EU-Level Industrial Policy: Where Do Potentials for Policy Improvement in Central and Eastern European Countries Lie?

Abstract *Regarding the issue of industrial policy in the 21st century, we are facing fundamental changes, including the servitisation of industry, the potential in upskilling and upgrading, the process of digital transformation, and the evolution of value webs and complex business ecosystems. In industry within the EU, we can identify internal differences: in principle, the EU is divided into a core and a periphery or, possibly, several peripheries.*

How will EU member states cope with these challenges? How is the EU-level industrial policy strategy likely to affect member states' (relative) positions? Is there policy-level differentiation? If so, how does it work; if not, what are the implications?

Keywords *industrial policy, European Union, servitisation of industry, Industry 4.0, manufacturing*

1. Introduction

In contrast to trade and competition policies, the European Economic Community (EEC) and then the European Union (EU) have never had a supranational industrial policy declared by primary EU law. Even so, there have from time to time been attempts at EEC/EU level to shape European industry through policy. In the early times of European integration, the widespread approach was strong interventionism, but at the national level. However, after the gloomy 1970s the approach had to be reviewed and, slowly, the structural and regulatory approach has gained relevance

and prevalence in European industrial policies (Grabas/Nützenadel 2013), leading to the current set of EU industrial policy priorities (EU 2018):

- fostering competitiveness;
- encouraging innovation;
- promoting sustainable and socially responsible businesses;
- promoting access to resources, including finance, skilled labour, energy, and raw materials;
- a well-functioning internal market;
- ensuring a business-friendly environment;
- supporting internationalisation of businesses;
- providing support for the protection of intellectual property rights.

Evidently, not only the attitudes and tools of European industrial policy have changed throughout the decades, but the EEC/EU, the global economy, and industry itself as well. The 1973 enlargement, with the accession of the United Kingdom, was perhaps the first moment to shed light on the consequences of industrial change on regional economic development, and on the social situation of the working class losing ground. At that time, textiles, coal and steel, and shipbuilding were considered so-called sensitive industries in Europe that needed special attention and care (Molle/Van Mourik 1987, Puslecki 2003).

The accession of the Southern European countries (Greece in 1981, Spain and Portugal in 1986) to the EEC posed a slightly different challenge to the European policy framework: regarding industrial specificities, these countries had been characterised by a significant relative technological backwardness and limited access to markets in comparison with the existing member states of the EEC, due to the lack of a liberal democratic system in these countries at that time (Acemoglu/Robinson 2012).[1] Accordingly, the need for economic and social cohesion was accentuated in the Single European Act of 1986. Nevertheless, the industrial policy approach of the time did not handle the convergence issue as a priority, neither at the European nor at the national levels; instead, these goals were hoped to be reached by the Community's reformed regional and structural policies, in the first place. Accordingly, and also because regional policy was the prior source of Community funding as European industrial policy has never disposed over financial resources, the industrial policy aspect was inserted into regional policy.

In 1988, among the five objectives of the reformed common regional policy, Objective 2 was aimed at "converting regions seriously affected by industrial decline". In the 1989-1993 period, the major beneficiary countries were the United Kingdom (ECU 2 billion; 35.5% of population), Spain (ECU 1.5 billion; 22.2%) and France (ECU 1.2 billion; 18.3%), followed by Greece, Ireland and Portugal. Objective 2 remained for the 1994-1999 period as well, covering 60.6 million (16.3%) of the EEC population at that time. Then, in the 2000-2006 period, the objective was recalibrated with the aim of "supporting the economic and social conversion of areas facing structural difficulties", but still supporting projects, mainly in the fields of enhancing the productive environment (with a special attention to small and medium-sized enterprises), and physical regeneration, often of earlier industrial sites (Goulet 2008). From 2007 onwards, namely in the 2007-2013 and 2014-2020 programming periods, the terms "industrial decline" and "structural change" no longer appear in the regional development policy documents, but competitiveness and employment come into focus instead (EC Regulation No 1083/2006, EU Regulation No 1303/2013). This shift was in line with the most recent change in the general approach to industry in Europe: that a horizontal (vs. sectoral) and more integrated policy setting should be applied, and that "[t]he Community's structural crisis is reflected in the unacceptably high level of unemployment" (ESC 1993:9), so the structural issue should be tackled in parallel with addressing (un)employment.

Another challenge driven by the enlargement of the EU was that posed by the post-socialist new member states (NMSs) after 2004. The system change from socialism to capitalism had brought about a drastic decline of industrial production and the collapse of numerous firms in these countries, independent of whether shock therapy had been applied (Kornai 1994). Although industrial sectors had, by the time of the accession of these countries, largely been transformed through the massive FDI-inflows following the transition from planned to market economies (Benacek et al. 2000), considerable structural and other deficiencies have remained. In fact, the segments of the global value chains located in the region have mainly been the lower ones, with paradoxical effects: while the incoming FDI has considerably contributed to the rather smooth and successful transformation of these countries from planned to market economies in economic terms, it has at the same time had negative unintended

social side-effects (Szelényi 2014) and has over time contributed to the preservation of these countries' peripheral or semi-peripheral status in Europe and the world (Nölke/Vliegenthart 2009, Farkas 2011), even if there are examples of fragile but beneficial changes in subsidiaries of multinationals in the region (Szalavetz 2016a, Szalavetz 2016b): job creation, enhanced industrial and human competences and capacities, access to new and/or wider markets, and in certain cases even development activities established at these firms. The fragility arises from the fact that these activities are less embedded locally and thus easily move on to other locations. In this respect, the "stickiness" of jobs (Von Hippel 1994, Hira 2009, Finegold/McCarthy 2010) also matters. The term "sticky" in relation to jobs refers to workplaces that are less likely to be relocated by multinationals along competitiveness considerations.

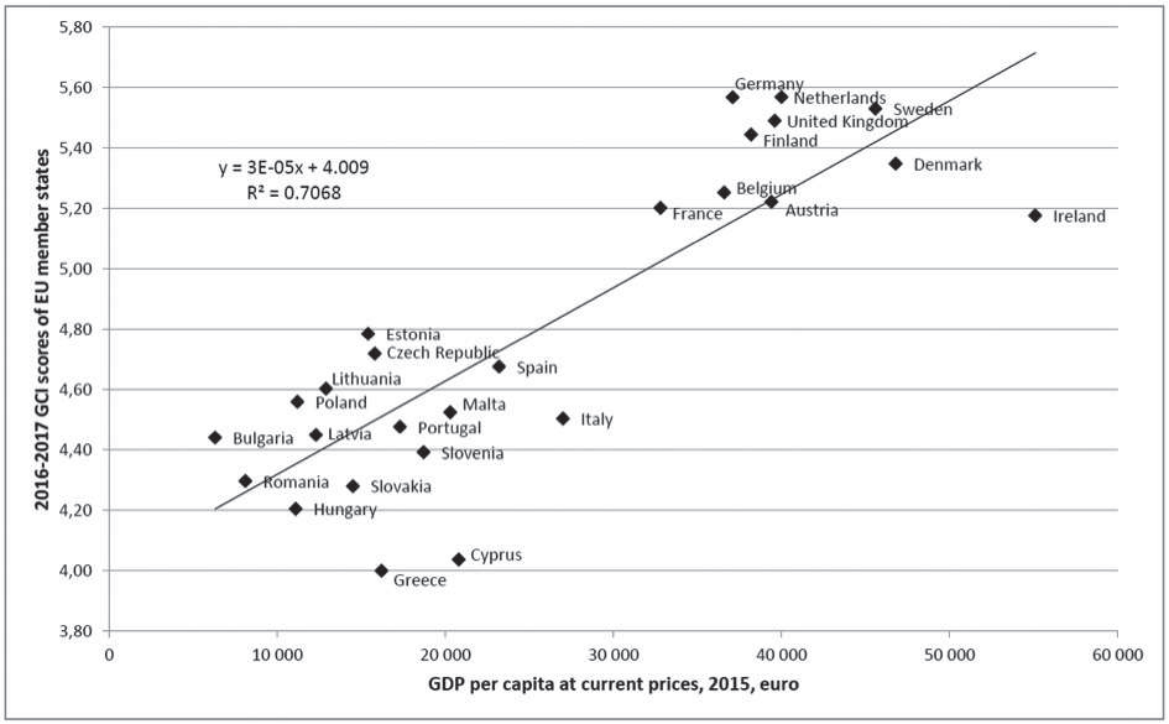

Figure 1: GDP per capita (2015, euro) and competitiveness (2016-2017, GCI score) of EU member states

Source: own edition based on Eurostat and World Economic Forum data

Note: Luxembourg is missing as an outlier (in GDP per cap. terms)

As regards the global context, the emerging economies in Asia and other continents have gradually appeared as ever more serious competitors, especially to the less developed parts of the European industrial base. As these latter segments tend to concentrate in the Southern and Eastern peripheries of the EU and the Eurozone, the challenge has taken on a regional aspect. In fact, most integrated European value chains are concentrated in the pre-2004 EU15 countries; however, intra-firm trade between Western European parent firms and their subsidiaries in Eastern NMSs account for between 20 and 70 per cent of total trade between these regions, so the significance of the Eastern NMSs for the EU15 countries varies greatly. Recently, Central and Eastern Europe (CEE) has mostly maintained its position as an offshoring destination, while such activities have been considerably withdrawn from Southern Europe, and China has become a preeminent reshoring destination for Europe-based multinationals. As a result, the performance of the Central and Eastern, and the Southern peripheries of the EU have more or less levelled off (Marin et al. 2017), which is also traceable in their GDP/capita and competitiveness levels (Figure 1). The global economic and financial crisis, and especially its consecutive wave in the Eurozone periphery with the sovereign debt crisis, has only aggravated these problems further and has rendered the prospects of the Southern Eurozone periphery gloomier still (Rangone/Solari 2012, Vihriälä/Wolff 2013, Gambarotto/Solari 2015). EU industry was largely affected by the crisis, though these effects were uneven across EU member states (Table 1).

	2007	2008	2009	2010
EU28	2 326 019.6	2 315 606.5	2 046 711.4	2 204 121.5
Belgium	60 182.1	59 011.5	53 592.0	57 549.2
Bulgaria	6 315.3	6 472.0	6 767.5	6 723.2
Czech Republic	39 718.9	45 520.1	40 385.4	42 390.1
Denmark	40 373.7	42 068.7	35 907.0	38 651.3
Germany	603 159.0	601 607.0	522 487.0	600 439.0
Estonia	2 881.8	2 922.3	2 439.4	2 838.5
Ireland	40 151.2	37 507.2	39 225.0	37 080.2
Greece	26 863.9	27 176.3	25 825.2	22 367.5
Spain	176 905.0	183 870.0	167 465.0	169 978.0
France	261 725.0	256 635.0	241 546.0	243 780.0
Croatia	7 463.3	7 983.5	7 656.5	7 830.4
Italy	296 524.5	296 233.8	259 929.2	270 579.4
Cyprus	1 382.2	1 387.4	1 395.4	1 426.8
Latvia	2 890.2	3 107.9	2 639.1	2 902.3
Lithuania	5 676.6	6 258.1	5 148.0	5 856.6
Luxembourg	3 584.9	3 185.0	2 346.2	2 660.7
Hungary	22 873.3	23 249.3	19 748.0	21 514.7
Malta	811.5	920.6	837.1	893.6
Netherlands	100 563.0	104 723.0	92 601.0	95 149.0
Austria	60 864.9	61 029.0	56 837.8	58 433.6
Poland	69 319.7	80 146.6	70 409.7	78 540.1
Portugal	26 829.4	26 032.6	25 064.8	26 594.2
Romania	29 001.9	32 044.6	28 512.7	35 434.7
Slovenia	8 375.8	8 582.3	7 466.6	7 651.0
Slovakia	15 187.2	17 054.5	14 065.3	16 167.3
Finland	46 329.0	45 596.0	35 893.0	38 495.0
Sweden	75 684.8	72 150.1	57 443.9	74 758.1
United Kingdom	294 432.6	262 881.1	222 581.8	237 339.1

Table 1: Industry value added (gross) in the EU and its member states, current prices, million EUR, 2007-2016

	2011	2012	2013	2014	2015	2016
	2 294 138.5	2 324 323.2	2 332 994.9	2 403 117.1	2 570 550.8	2 590 206.3
	58 694.7	58 205.9	58 506.3	59 251.4	61 829.0	63 551.3
	8 277.5	8 370.0	8 225.7	8 428.2	9 209.9	10 130.6
	45 664.6	45 044.1	43 701.8	45 855.1	48 753.0	51 038.1
	40 304.5	41 916.1	41 763.2	42 047.3	42 478.9	44 755.4
	635 684.0	650 111.0	652 498.0	684 476.0	711 692.0	728 603.0
	3 265.3	3 355.3	3 612.5	3 825.1	3 790.4	3 788.0
	41 313.9	40 773.6	40 866.4	43 419.4	94 454.5	93 318.2
	22 016.4	21 570.5	21 790.8	21 492.5	21 047.4	20 971.3
	171 651.0	165 568.0	163 944.0	165 854.0	176 484.0	181 210.0
	254 065.0	258 467.0	263 767.0	267 166.0	278 030.0	279 973.0
	8 043.6	8 043.6	7 816.8	7 810.9	7 936.1	8 186.7
	273 890.8	267 781.0	267 973.3	270 480.9	278 865.9	288 616.1
	1 297.0	1 246.6	1 146.7	1 090.3	1 171.2	1 197.0
	3 176.9	3 379.0	3 337.0	3 265.0	3 369.1	3 477.5
	6 930.7	7 493.0	7 449.4	7 630.4	7 575.0	7 709.9
	2 705.8	2 673.3	2 942.2	3 251.0	3 345.4	3 476.1
	22 202.1	21 909.0	22 184.7	23 446.1	25 633.1	25 752.3
	870.8	817.5	842.5	862.5	890.2	930.5
	99 481.0	101 456.0	99 658.0	95 277.0	96 515.0	96 214.0
	61 443.0	63 655.2	64 132.3	65 533.6	66 936.6	67 205.3
	84 251.3	88 346.6	87 081.6	92 405.4	99 714.6	100 099.7
	25 587.6	24 991.3	25 399.5	26 488.0	28 753.0	29 464.9
	37 958.7	33 486.1	36 344.3	38 020.6	38 591.7	39 084.8
	8 041.9	8 095.1	8 346.6	8 812.7	9 092.0	9 479.9
	17 009.0	17 504.0	17 050.9	18 362.7	18 773.0	19 753.2
	38 340.0	35 286.0	35 983.0	36 313.0	37 341.0	37 615.0
	80 214.4	79 748.9	79 465.1	77 357.8	74 424.2	76 359.2
	241 676.3	264 909.3	267 421.0	285 194.5	323 877.2	298 782.2

Source: Eurostat (code: nama_10_a10)

Obviously, industry itself looks very different from what it was like decades ago. Technological advancements, with special regard to the evolution and spread of information and communication technologies (ICT), have genuinely transformed the industrial sector as a whole. Similarly, the recent servitisation of manufacturing has been influential. In fact, both in the global sphere and in Europe, various regions have achieved various levels of success (or failure) in adapting to these changes. In this article, we argue that this has not depended solely on local, national and European intentions and wisdom, but that history and path-dependence also play a role. EEC/EU industrial (and, in part, other) policy actions have also influenced the status of the member states, just as have done the national institutional settings.

2. The various challenges that policy is facing

The basis of any discussion of EU industry and policy includes conceptual and methodological questions, starting with what is (and what is not) considered as industry at present. In our view, the most relevant conceptual issue is the relation between (business) services and (classical) industry. We by no means should neglect the quality-type changes, most of which are rooted in the ongoing technological transformation.

2.1 Conceptual-methodological challenges

We can ask what industry is in our days, and how it is changing with the technological and organisational advancements. The servitisation of developed industry is a prevalent phenomenon. Vandermerwe and Rada (1988) described it as the process of adding value to what is offered to the customer through bundles of goods, services, support, knowledge and self-service. Although the concept is not new (see also Levitt 1972 and 1976), economic literature recognised it rather late: the number of papers referring to servitisation as a noteworthy issue grew only after 2003 and, more significantly, since 2009 (Hou et al. 2013). In Veugelers' (2013) approach, the emphasis is on manufacturers providing solutions rather than products to customers, which leads to the blurring of the boundaries between manufacturing and services.

Despite the already documented service paradox (Gebauer et al. 2005, Gebauer et al. 2012, Visnjic Kastalli/Van Looy 2013), namely that when some companies face difficulties in relation to servitisation, it may even result in their declining performance, competition is intensifying in the service content added to products. Global trade integration might further enhance competition in higher value-added activities where European industries have traditionally had a comparative advantage (EC 2014). In their study, Brax and Visintin (2017:17) define different types or levels of servitisation as "conceptually different, generic value constellations". The value of a final manufacturing product embodies, directly and indirectly, value added created by services provided either domestically or abroad. This shows the relevance of services for manufacturing production – and, on the other hand, the role of manufacturing as a carrier function for (business) services. Visnjic Kastalli and Van Looy (2013), but also Lee et al. (2016), examined whether services are provided integrated in a business model as an inseparable strategic complement to products, or only as an add-on asset. They found that, in this latter case, the companies may more likely outsource services either domestically or abroad to specialised service providers.

With this increase in the share of services in manufacturing, we must review how we measure industry's performance. As stated by ECSIP (2014), manufacturing has to be defined in a broader sense, considering all activities related to the production of manufactured final products. This is how the manufacturing value chain is calculated (by means of input-output analysis). A huge difference appears along the different methods, though. When considering the share of manufacturing in the contribution to the global final demand of manufactured products, the EU27, in the classical industry perspective, reached 16% in 2011, yet, in the value chain perspective, 22% of value added was generated in the EU. Moreover, within the manufacturing value chain, about 40% of value added was generated by service activities (ECSIP 2014). Therefore, caution is called for in respect to (any) figures, and in-depth quality analyses seem inevitable.

Across EU member states, the shares in value chains correlate positively with the shares of manufacturing in GDP. What is more problematic, from a dynamic perspective, is that countries which have lost shares in manufacturing value added to GDP (i.e. the Southern Eurozone members

who were also tendentiously more affected by the latest crisis [Mazzucato 2015]), could only partly compensate the loss through further contributions to the manufacturing value chain by providing corresponding business services. A deeper change is nowadays affecting heavily industrialised countries.

The growing complexity of modern manufacturing, resulting from the application of new technologies, has also increased the service content of many manufactured goods (Miozzo/Soete 2001). Infrastructural and knowledge-intensive activities that were previously classified as manufacturing are now considered as service. The higher the degree of complexity of an economy, the tighter the linkage between the production of services and the demand for these from manufacturing industry.

Innovation and value creation themselves are being transformed in fundamental ways, further blurring the distinction between manufacturing and services. Services can be categorised relative to their position in the value chain as upstream services, including activities such as R&D[2] and design; core (production) services including supply management, production and process engineering and other technical services; and downstream (market) services, mainly distribution and after-sales maintenance (ECSIP 2014). These are all manifestations of the servitisation of manufacturing; what is common to them is that they all contribute to EU manufacturers' international competitiveness through comparative advantages. Through these advancements, EU industry seems to be able to reverse the decline in industrial export market shares and in the share of industry in total value added (EC 2017). As a matter of fact, this can only be achieved through innovation and industrial upgrading, which appear to be a must for the EU, as emerging economies such as China are becoming competitors in the higher value added segments as well.

2.2 Technology-driven advancements in industry

The fourth industrial revolution, or Industry 4.0, is widely discussed in current literature (Manyika et al. 2013, Bloem et al. 2014, Schwab 2016, Smit et al. 2016, Hallward-Driemeier/Nayyar 2018). We hereby refer to the latest technological changes led by advanced digitalisation (e.g. cloud technology or the Internet of Things), automation and robotisation (e.g. near-autonomous machines and vehicles), 3D printing (i.e. tailor-made produc-

tion becoming ever more feasible and profitable) and advanced bio- and nanotechnology (offering new materials and processes to regular industrial activities), by this umbrella expression. As for organisational innovation, we consider upskilling and upgrading, the complex process of the digitalisation of organising work (from design to after-sales services), the evolution of value webs (instead of the classical value chains) and, again, rather complex business ecosystems (Kelly/Marchese 2015), often across borders, as the most relevant ones.

This ongoing and recently quite accelerated transformation of the technological environment of manufacturing opens up new potentials. Enhanced efficiency may change the recently worsening trends of production effectiveness (Kovács 2017a). Advantages of digitalisation appear even in unexpected areas such as greening (the transition to a more environmentally friendly economy), or the shift to the circular economy (where lifecycles of products do not end as waste but are put in circulation again in one way or another) (Kovács 2017b). However, commitment is also a necessary condition. An additional appearance of the usage of Industry 4.0 techniques, due to real-time operability, interoperability and modularity, could be the almost just-in-time adaptation to market demands and needs (Hermann et al. 2015).

Value can also be added through the creative innovative capacities triggered by Industry 4.0. Lee et al. (2013) pointed out that the most important effect on manufacturing is the improvement of predictive manufacturing systems that contribute to the development of predictive analytics to mitigate uncertainties, including unreliable downstream capacity, unpredictable variation of raw materials or parts in terms of delivery, quantity and quality, market and customer demand fluctuation, incomplete product design due to the lack of accurate estimation of product state during production and usage, and may even meet requirements like waste reduction (to achieve greener production) and work reduction (to realise leaner production).

Industry 4.0 requires answers and strategies on three fronts: business, government and regulation, and the population itself (Andor 2018). There are huge differences among industrial sectors in how they are affected by ICT. We can define three big groups: ICT-user industries (e.g. the packaging sector, biochemistry and biotechnology, eco-friendly industries, logis-

tics); ICT-producer industries; and non-ICT-intensive industries. How an ICT-intensive industry can prosper is highly dependent on absorptive and diffusive capabilities, jointly referred to as readiness (Kovács 2017a).

According to the above mentioned effects of the latest industrial revolution, we found an analogy with Dudley's (2010) thoughts: the present technological environment of manufacturing and digitalisation may appear as a general purpose technology (GPT), as it does not offer the final solutions either in industry or in other areas of life, but provides the tools to properly select and achieve our new targets.

2.3 The presence and nature of intra-EU differences

If we take a look at EU industry, we can identify intra-EU differences. In principle, the EU is divided into a core that is characterised by structural competitiveness, and a periphery or, possibly, several peripheries, that can be described by constrained cost competitiveness and where the moderate innovators and innovation followers of the EU are are found (EU 2017).

We have already discussed the increasing service content of manufacturing. Now the question is how the EU member states perform at the level of integration of services in manufacturing. They can decide to either add it in-house or through ordering buy-in services sourced from service providers. In case of the latter, this may have a local/domestic or an international origin. The two cases appear differently in statistical accounts: in the former case it will be included in manufacturing value added, while in the latter it will appear as service (UNIDO 2013, Lanz/Maurer 2015).

Nevertheless, the changes in the service content are not uniform: some countries remain relatively specialised in manufacturing (Germany, Austria and V4[3]/CEE countries), others specialise more in business services (UK, the Netherlands, Belgium and France), while the remaining regions (Baltics, Southern Europe) face a decline in manufacturing because of a less favourable manufacturing base, paired with a failure to improve specialisation in business services. This specialisation pattern within the EU (Figure 2) can be explained by relative differences of productivity growth in manufacturing and services, and wage drift across sectors. Other factors also seem to play a role (e.g. agglomeration and scale effects, FDI patterns, evolution of production linkages, industrial and economic history). Moreover, manufacturers in larger countries can rely on a more substantial base

of domestically supplied services that realise economies of scale, while those in smaller countries need to rely more on foreign-sourced business services (ECSIP 2014). And, of course, the service providers of larger countries benefit also from the integrated internal market of the EU. Even so, potential barriers to cross-border trade in services and international manufacturing-services linkages are a relevant policy issue, even where legislation is rather up to date and Industry 4.0 is likely to increase tradability in the EU.

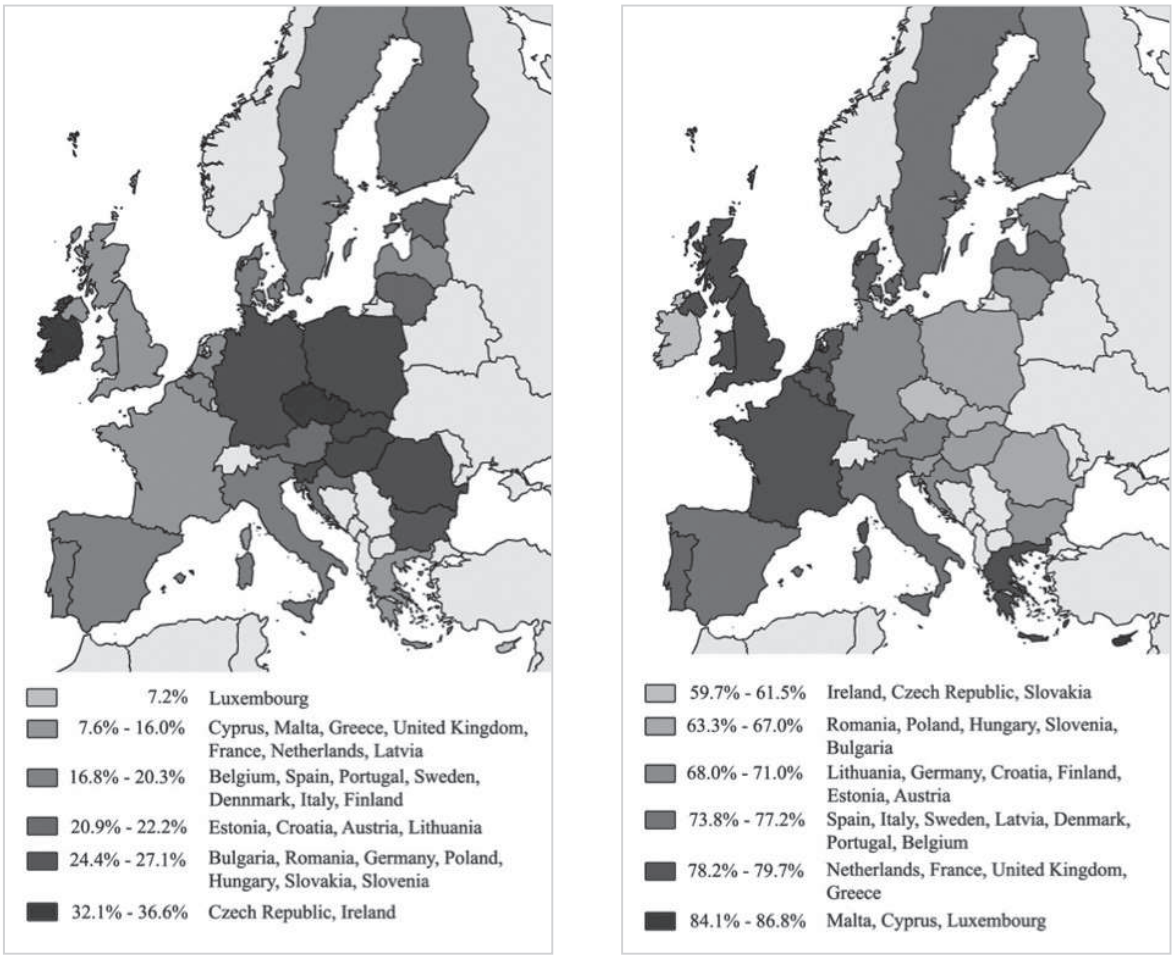

Figure 2: Share of industry (left) and services (right) in gross value added (2016, %)
Source: own edition with Openheatmap based on Eurostat data (code: nama_10_a10)

Among those actors that represent the innovative base of manufacturing, we find a vast majority (99.2%) of small and medium sized enterprises (SMEs) producing just 45% of value added, mostly in the services sector. The majority of SMEs in the post-2004 NMSs are younger, less experienced and are often farther from the technological frontier, with weaker technological capacities than their counterparts in the EU15. In addition, ca. 75% of European SMEs are concentrated in five sectors (in descending order): wholesale and retail trade, manufacturing, construction, business services, and accommodation and food services.[4] Regarding manufacturing, SMEs account for 59% of employees, 45% of value added and 39% of sales (Vladimirov 2017). Regarding employment, it is the case that particularly young firms in knowledge-intensive services based in business-friendly environments had large job creation capacities (Muller et al. 2015), while some peripheral countries (namely Ireland, Malta, Greece and Spain) stood out both in terms of annual growth in the number of enterprises (Ireland and Malta: over 5%, Greece and Spain: ca. 4%) and in employment (Malta: ca. 5%, Greece: ca. 4%, Spain and Ireland: over 3%) in 2015 (Muller et al. 2016:15), which is in part due to the previously harsh situations in these countries, although this had resulted in low base year values.

When looking at SMEs in the post-2004 NMSs, we can see that their general economic and institutional environment is less sophisticated. The industrial structures differ in terms of technology, and in innovation and absorption capacities (Vladimirov 2017). Therefore, setting unique standards (levelling the playing field) for SMEs all across Europe may well reproduce or even deepen the existing inequalities (Borbás 2014:101). The European Commission had already noted that "differences in innovation performance in the EU have started to increase, signalling a possible halt to convergence in Member States' innovation performance" (EC 2013a:5). However, the specific action plans to address the problems of SMEs in this peripheral region have yet to be drafted. One strategy that SMEs may follow is clustering. Successful participation in a cluster requires a minimum level of social capital and confidence embedded in social relations – but this is precisely what is lacking in many NMSs. SMEs in these countries are therefore less willing to collaborate. According to Karaev et al. (2007), there is not much empirical evidence of successful clustering in post-socialist economies.

As stated above, FDI played a major role in the early transition from socialism to capitalism. This has had positive (possibility to join global value chains [GVCs] and benefit from knowledge spillover) and negative (competitive pressure) impact on local SMEs (Drahokoupil/Galgóczi 2015). In GVCs, there is always scope for functional upgrading. SMEs' chances for that depend on their absorptive capacity and the institutional environment. As stated earlier, these are relatively weak in NMSs. Staritz and Plank (2013) are highly critical in respect of multinationals' investments in transition economies, as these companies' strategic interests (exploitation of low costs) fundamentally contradict long-term local interests (upskilling and upgrading). Evidence shows that the sought-for upgrading is not happening, in fact quite the contrary: domestic value added in gross exports declined in most NMSs in the 1955-2011 period (Bierut/Kuziemska-Pawlak 2016). At the country level, Germany is definitely a "headquarter economy" (where multinationals' headquarters and core development activities are located) vis-à-vis the NMSs, which may thus be condemned to remain "factory economies" (providing location for lower value-added subsidiaries) in the longer run as well (Baldwin 2012: 13-14, Szalavetz 2017, Vladimirov 2017, Stöllinger et al. 2018). Also, local SMEs tend to have difficulties in becoming suppliers to multinationals and thus enter GVCs (Vladimirov 2017). The EU has in fact limited power to intervene in these processes – but let us take a look at policy.

3. The policy level

Industrial policy (IP) can be described as government efforts to encourage the development of some parts of, or the entire, industrial sector. Bianchi and Labory (2006) define IP as a set of governmental measures aimed at guiding the structural transformation of an economy to improve a country's industrial performance. Rodrik (2007) claims that IP is well designed if it eventually maximises its potential to contribute to economic growth while minimising the risk of generating waste and rent-seeking. Pianta et al. (2016) have recently authored a comprehensive report on a progressive IP for Europe that "should favour the evolution of knowledge, technologies and economic activities in directions that improve economic

performance, social conditions and environmental sustainability" (Pianta et al. 2016:30). To that end, a considerable role is to be devoted to the public sector in the forms of publicly owned firms, public investment banks and public-private partnership, public R&D and publicly financed support to dynamic publicly owned firms, and public procurement.

3.1 The state of affairs in EU-level industrial policy strategies and actions

As was mentioned at the beginning of this article, the horizontal approach was introduced in the EU, as of the mid-1990s, in order to find answers to revealed global challenges. The new approach involved the theory of clusters and the recognition of the importance of GVCs. The main goal was to create an environment favourable to industrial development, and to overcome the negative effects of deindustrialisation (Pitelis 2006). In addition, attention has been devoted to SME development as well. This focus has been strengthened under the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) programme and Horizon 2020. However, despite the horizontal approach, some sectoral aspects are still visible today: instead of textiles, steel and shipbuilding, we can see steel, space and defence industries handled independently, with an increased emphasis (EC 2017). A 2002 EU policy paper saw the Eastern enlargement as a major source of opportunities for industries both in the EU15 and NMSs (EC 2002).

In the European policy discourse the earlier sector-related industrial policy itself is increasingly focusing on competitiveness, and thus the policy has been largely replaced by competitiveness policy and enterprise policy (Vladimirov 2007). In parallel, the EU has experienced significant changes in the importance of the manufacturing sector in terms of its contribution to GDP and employment, asserting that "Europe needs to reverse the declining role of industry in Europe for the 21st century. This is the only way to deliver sustainable growth, create high-value jobs and solve the societal challenges that we face" (EC 2012:3). In 2014 the European Commission confirmed its commitment to reindustrialisation by setting the objective of increasing industry's contribution to GDP to 20% by 2020 (EC 2014). Veugelers and Batsaikhan (2017) argue that this is rather pointless as a target in itself since there can be many structural and/or historical

reasons for the actual share of industry in GDP. Also, the absolute and relative value-added capabilities of the industrial (i.e. the technological level) and services (i.e. sophisticated business services vs. low-wage services like tourism) sectors of countries have an effect on the overall composition of GDP.

Most recently, in September 2017, the European Commission released "A renewed EU Industrial Policy Strategy" (EC 2017). The strategy reaffirms the importance of industry to economic prosperity in Europe. To that end, EU industry's ability to adapt to and embrace technological change is key. Nevertheless, the Commission admits that the responsibility lies with companies, as upgrading is their task to undertake. The strategy sees policy's main roles in promoting improved regulation carried out with the involvement of stakeholders. Among these, we can find advocates of other EU policies (single market, sustainability, investment, digitalisation) along with representatives of industry and business, as well as member states, regions, cities, social partners and the civil society.

3.2 Policy implications of the challenges

Importantly, we find that, despite the evident and rather persistent intra-EU differences in industrial performance and development prospects, no explicit policy approach and/or tool at EU level can be detected that would further the mitigation of these. Accordingly, the main questions that arise are the following: How will the various EU member states cope with the identified challenges? How is EU-level industrial policy strategy likely to affect member states' (relative) positions?

Revitalising manufacturing requires a specific focus on increasing SME productivity and value added. However, policy design is also challenged by lower economic growth, narrowing financial leeway and so a lower amount of capital for productive investments (Mauro-Zilinsky 2016), factors which altogether mean a narrowed policy leeway.

Lower economic growth also contributes to growing inequalities, which is a barrier to the diffusion of both technological and non-technological innovations. This may also undermine the political stability of a society (Milanovic 2016). If the EU does not take into consideration the obvious differences between member states, then the revolutionary effects

of Industry 4.0, due to the interference between the member states, may in fact further deepen the gap between them (Kovács 2017b).

4. Conclusions and policy recommendations

Taking into consideration the aspects reviewed by this article, servitisation appears important to focus on, since the closer the relationship between industrial production and highly-skilled service sectors, the more 'sticky' jobs are likely to evolve. Thus the performance of manufacturing could be improved through policies that support the development of business services activities and their quality, and vice versa. Regarding smaller member states, improved access to foreign business service suppliers could be a policy objective. But that would seem to matter for the manufacturing core (headquarter) countries as well, since they could benefit from enhanced competition among business service suppliers. The possibility of internationalisation of business services is also relevant for those countries that are becoming more and more specialised in such services. All in all, there is an increasing need for cross-border flows of services within Europe, and so further steps towards integration should be undertaken (the services directive, reinforcing the internal market, a digital single market). Although these steps should be taken with caution, as they should by no means lead to more uneven development across Europe.

Reshaping of industrial policy should include answers to the fundamental question as to what the EU's objective(s) in relations to industry should be (as the 20% target is highly contentious). Also, who will take the lead? The EU is governed by its member states and these latter obviously have diverse interests stemming from their varying (relative) situations and positions. In what way shall the "smart, innovative and sustainable industry" (EC 2017) be secured across the EU?

Stehrer et al. (2016) talk about smart specialisation, which is a bottom-up approach in discovering regions' strengths, resources and latent comparative advantages, according to which selected industrial activities may be promising for certain regions. Landesmann (2015) also recommends that industrial policy formulation and execution must take place at all levels (regional, national and supra-national). However, we must admit that,

even with the involvement of local stakeholders, the problem of picking a winner persists: an unavoidable feature of any active innovation and industrial policy is that the most promising areas or industries somehow have to be selected, with all the associated risks and consequences. When deciding, we can only hope that the positive results outperform the negative outcomes. As regards the question of leadership, Pianta (2015:143) says that "individual EU countries are too small to develop an industrial policy that could be effective in the current context of globalisation." Therefore, EU industrial policy also has the task of reconciling member states' interests, as well as public and private interests.

Once EU targets are set, the next issue is how to sell the vision to key stakeholders. Private actors of industry are key players, as they provide a high share of industrial R&D&I[5] expenditures (Veugelers 2015). Nevertheless, this growing involvement of private stakeholders in policy design should target the previously mentioned locally active multinational enterprises as well as their (potential) local SME partners. Compared to a selective and determined progressive industrial policy, such solutions may be more successful in the longer run due to the efforts undertaken to harmonise various interests. For enterprises (particularly SMEs) in NMSs, improving their participation in policy decisions is crucial but definitely requires a mix of measures specifically addressing their local challenges (Vladimirov 2017), rather than anticipating their contribution to a single policy instrument. For these enterprises, policies targeting SMEs' entrepreneurial culture and trust development, improving technological readiness, clustering, and joining GVCs in prospective ways (i.e. with upgrading in sight, see Szalavetz [2016c]) are needed.

Another issue at stake is firms' participation within the newly evolving transnational/global digital ecosystems. National and EU industrial policy measures should include actions that promote such advancements across the EU. The general purpose technology (GPT) character of Industry 4.0 is another opportunity for firms that policy can enhance. This may hold promises also for NMSs that are currently playing roles of factory economies. Nevertheless, the integration of value creating activities cannot be confined to production: cyber-physical systems integrate the whole value chain (or web).

As changes are profound and fast, policy actions must show flexibility and must provide possibilities for interim intervention if deemed necessary. One major benefit of Industry 4.0 is advanced data science – something that policy should also embrace. Policy design could also outreach to areas such as education and training. Also, the allocation of funds and resources should take place rapidly and dynamically. The presented challenges require flexible adaptation but, in reality, they may still be too slow for financial sector preferences. These are the cases where the states' role comes into the picture (Mazzucato 2013). Could the EU actually play the role of Mazzucato's (2013) entrepreneurial state? In financial terms, definitely not, for the time being. Kovács (2017b) in fact recommends for the EU to take up relevant industrial projects ignored by the financial sector for reasons of unprofitably long return periods. The public sector's involvement may also be justified in the compensation of SMEs. We consider these cases as the very space where the progressive industrial policy approach is relevant and desired.

The role of an "appropriate institutional context" (Pianta et al. 2016:34) is also mentioned in relation to progressive IP, but not discussed in detail. On the other hand, Berglof (2016), applying the Neo-Schumpeterian framework in which the three core assumptions are that long-run growth is driven by innovation, innovation results from entrepreneurial activities, and creative destruction is critical, warns that state capacity largely determines the success of industrial policy. We find this latter observation crucial, as it implies that progressive IP cannot be universal.

Some less considered advantages also arise from the widespread usage of Industry 4.0 techniques in the applied policy instruments themselves. For an example, the earlier grey or black economies[6] can be whitened/controlled due to greater transparency and investigation techniques, and the additional tax incomes may be channelled into further developments in the economies' technological readiness (Kovács 2017b).

Timing and sequencing of policy actions should also be subject of consideration; a systemic approach is needed in this respect. Industrial policy should match a wider development policy framework and be in line with business preferences. At this point we emphasise innovation policies and just mention that, as state aid is an area of EU competition policy, it is

thus connected to industrial policy and state aid law, and its enforcement can also be scrutinised from this perspective (Aghion/Akcigit 2017).

Innovation appears both in the horizontal and in the sector-specific approaches of the EU's current industrial policy context. Innovation can be stimulated by various external (institutional and business environment) and internal (company capabilities in terms of knowledge, human capital and absorptive capacity) conditions (Bianchi/Labory 2006). Accelerating the catching-up process of countries that are farther from the technology frontier firstly requires effective industrial upgrading and then improving the adoption (or absorption) of new technologies and skills development, rather than immediate innovations (Veugelers 2015). A dual support is needed, both for innovation itself and for building innovation capabilities (Vladimirov 2017). More attention should be paid to stimulating the quality of human capital formation and supporting firms' incentives to adopt new technologies, everywhere tailored to local needs. This suggests a need for the development of customised policies and not simply the mechanical application of a general EU-level policy approach (Reid 2011).

In fact, the 2017 Innovation Union Scoreboard (EU 2017) reveals that EU innovation performance as a whole has improved, especially thanks to human resources, an innovation-friendly environment, own-resource investments, and attractive research systems; however, if we check the details, there is no significant improvement in human resources in favour of NMSs, and their distance from innovation leaders has not narrowed. Education has enormous responsibility in improving humans' innovation absorption capacities, their entrepreneurial motivations, lifelong learning, and the utilisation of Industry 4.0 as a general purpose technology (GPT). According to Kovács (2017a), the national educational systems do not yet comply with the challenges of the digital era, or at least not to the same extent. To many firms, employees and their skills are the most valuable assets. As workers (both high and lower skilled) are less mobile than companies, and as technological capabilities are embodied in them, they represent a unique locational advantage which makes a firm's activity less transferable to other locations. Overall, more coherence needs to be realised among industry, industrial policy, education, and the labour market. Such advancement could trigger a virtuous circle: well-designed policies implemented by a capable EU may enhance the quality and readiness of

the human resources and the supportive nature of the business environment, which would then yield improved industrial performance that may serve as a form of reassurance, and thus provide feedback to the design of future policies. This could also be a way to cope with the challenge that the speed of technological change raises, both for policy and the economy.

We agree with Stehrer et al. (2016) that there should be at least a national/regional focus on individual industries (referred to as smart specialisation earlier), since the present state of technological readiness and future prospects vary considerably across the EU. This consideration is entirely in line with endogenous growth theory (Aghion/Howitt 1998) and progressive industrial policy (Pianta et al. 2016). Landesmann and Stöllinger (2018) have developed an "appropriate industrial policy" specifically for catching-up European economies. They emphasise the vulnerability of these countries and also point out the contradiction between a European "level playing field" and the "heterogeneity" of the catching-up economies (Landesmann/Stöllinger 2018:10).

The sectoral perspective also holds the possibility of specific policy recommendations. The so-called sunset industries where the EU does not have comparative advantages (e.g. the textile and leather industry, the electrical and optical equipment industry) and industrial sectors where substantial comparative advantages exist (e.g. machinery, transport equipment, or chemical industries) should be handled differently. Besides national or possibly regional goals adjusted to the local strengths and potentials, other horizontal measures (e.g. educational and vocational training, R&D policies, or the completion of the single market) may complement them. Thus the sectoral perspective should be accompanied by an EU-level effort to foster value-added generation capabilities all across the EU (Kovács 2017b) – again, tailored to national and local needs and particularities at the level of specific actions.

Certainly, a one-size-fits-all type policy approach is not a solution; it is not realistic, not feasible and, even if everybody upgrades relative to their past performance, differences will still persist. Nevertheless, industrial policy strategies and actions remain important for the EU. Accordingly, in our view, sophistication and differentiation are where possible solutions lie, combined with the upskilling and upgrading of the very policy itself, both in terms of design and implementation.

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1 The 1995 enlargement was insignificant in this respect.
2 R&D: Research and Development
3 The abbreviation V4 refers to the four Visegrad countries: Poland, Czech Republic, Slovakia, Hungary.
4 The four sectors outside manufacturing all belong to the overall services (tertiary) sector.
5 R&D&I: Research and Development and Innovation. In 2013, the EU expanded its R&D policy into R&D&I policy.
6 Grey economy: pursuit of economic activities that are legal but are not executed legally, e.g. tax is not or not fully paid. Black economy: pursuit of illegal economic activities which therefore have to be executed without the oversight of public authorities and, consequently, no taxes are paid.

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Abstract *Die Industriepolitik steht im 21. Jahrhundert vor grundlegenden Veränderungen. Dazu zählen die Servitization der Industrie, Möglichkeiten zur Verbesserung und Modernisierung, die Prozesse der digitalen Transformation sowie die Entwicklung von Wertschöpfungsketten und komplexen Geschäftsökosystemen. In der Industrie innerhalb der EU können wir interne Unterschiede feststellen. Grundsätzlich ist die EU in einen Kern und in eine, oder möglicherweise mehrere, Peripherien unterteilt.*

Wie werden die EU-Mitgliedsstaaten diese Herausforderungen bewältigen? Wie wird sich die industriepolitische Strategie auf EU-Ebene voraussichtlich auf die (relativen) Positionen der Mitgliedsstaaten auswirken? Wird eine Differenzierung auf politischer Ebene stattfinden? Wenn ja, wie kann diese funktionieren? Wenn nicht, was sind die Folgen?

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