

Structural Change, Trade and Global Production Networks:

An 'Appropriate Industrial Policy' for Peripheral and Catching-up Economies

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Abstract

The global economy has been undergoing rapid structural change: the impressive development processes in a range of emerging economies have induced strong shifts in global trade shares; international production networks (IPNs) are characterising regional and global trading relationships and we observe also persistent changes in the positions of countries in global value chains due to rather rapid technological and human capital upgrading. The aim of this paper is to assess these developments, but also discuss the importance of – what we call – ‘appropriate industrial policy’ (AIP) for countries at different developmental stages to support their position in the current global context. We emphasise in particular the role of AIP for European low- and medium-income economies (LMIEs) as the recent financial and economic crisis has shown that they are particularly vulnerable with respect to ‘structural external imbalances’ and thus policies to support their tradable sectors are of great importance.

Keywords: appropriate industrial policy, structural change, structural upgrading, Emerging Europe, emerging economies, international production networks, global value chains, catching up

JEL classification: L16, L52, F15, F14, F63

CONTENTS

1.	Introduction	1
2.	Industrial policy in an age of ‘deep’ regional and global economic integration.....	2
3.	Global differentiation amongst (potentially) catching-up economies	3
4.	Europe’s catching-up economies and the case for ‘appropriate’ industrial policy: the macroeconomic context	9
5.	Towards an ‘appropriate industrial policy’ (AIP) for peripheral and potentially catching-up economies (PCUs).....	16
6.	‘Appropriate industrial policy’ (AIP) in the European context	22
	Conclusions.....	25
	Bibliography.....	28

TABLES AND FIGURES

Figure 1 / World market shares, gross exports, 1970-2015	4
Figure 2 / World market shares, gross exports, 1970-2015	4
Figure 3a / Export structures by technology content of products, gross exports, 1970-2015	6
Figure 3b / Export structures by global regions.....	7
Figure 4 / World market shares in value added exports (VAX), selected countries and country groups, 2000 vs 2014	8
Figure 5 / Composition of the current account of the balance of payments, 2003-2015, in % of GDP	11
Figure 6 / Contributions of countries to 'Wider Europe' exporting activity.....	12
Figure 7 / VAX shares relative to GDP shares of different European countries and country groups.....	13
Figure 8 / Shares of European LMIEs in cross-border production networks (divided by their shares in European GDP) – 2005, 2008 and 2014	14
Figure 9 / VAX shares of LMIEs in 'Wider Europe' – in high- and medium-high-tech industries; gaps relative to advanced West European economies (=0.0)	15
Matrix 1 / Country characteristics and 'appropriate industrial policy'	20

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1. INTRODUCTION

This paper attempts to develop the concept of an ‘appropriate industrial policy’ (AIP) for peripheral and ‘potentially catching-up economies’ (PCUs)¹ in the context of highly integrated regional and global economic settings.

Developments over the past 30 years were characterised by strong features of international and regional integration: the ‘rules of the game’ of that integration were such as to, on the one hand, constrain countries with respect to the instruments they could use to undertake ‘industrial policy’ as compared to past experiences. For instance, it became hardly possible to use tariff protection, and – in the EU context – competition policy seriously constrained the use of traditional instruments of industrial policy such as industry-specific subsidies. On the other hand, the pattern of international integration provided scope for much faster ‘catching up’ of countries that started from a lower level of economic development than was the case in the past. We shall explore these constraints and potentials in the following.

Another feature that emerged was that while ‘trade in tasks’² increased dramatically the potential for outsourcing and international production specialisation and integration, there were also strong features of geographic agglomeration of industrial activity, both within countries as well as across countries and country groups. Thus, for example, in Europe we observed a strong move of industrial capacities towards a ‘Central European Manufacturing Core’³ while industry withdrew from other countries and regions, thus leading to a more pronounced ‘core-periphery’ pattern in industrial activity across the European space.

In this phase of increased international and regional integration, it also became apparent that there were new features of vulnerabilities emerging: as financial markets got more integrated, current account imbalances could lead to unsustainable patterns of catching up, evolving debt positions led to major crises in banking systems and in public finance, thereby interrupting and even reversing the results of previous catching up. We shall attempt to show in this paper that what has traditionally been seen as the domain of macroeconomic policies to deal with macroeconomic imbalances and macroeconomic crises

¹ We prefer to use the concept of ‘potentially catching-up economies’ (PCUs) compared to that of ‘emerging economies’ as we want to point to the fact that not all low-/medium-income economies are on a successful path of closing their income (per capita) gaps with more advanced economies. Linked to that is also the fact that a significant share of PCUs remain quite marginalised in global trade and integration patterns, hence the term of ‘emerging’ seems in their situation a misnomer.

² ‘Trade in tasks’ (see for example Grossman and Rossi-Hansberg, 2008) refers to the dramatically increased potential for international trade due to the ‘splitting up of value chains’ that allows countries to specialise on specific production stages of internationally organised production networks (IPNs). We shall refer to the relevant literature in section 2.

³ See Stehrer and Stöllinger (2014).

phenomena does require the use of industrial policy instruments to correct them, particularly in highly integrated regional economies such as the European economy.

There has indeed been a revival of thinking about industrial policy in Europe (see e.g. Aghion et al., 2011). However, our paper is in parts motivated by the fact that the revival of thinking of 'industrial policy' with its focus on innovation and R&D has been biased in the direction of the needs of the more advanced economies of Europe, while the needs of less advanced economies and regions have been somewhat neglected (see the recent European Commission documents; see EC, 2010, 2012, 2014, 2017). Hence our emphasis on 'appropriate industrial policies'.

2. INDUSTRIAL POLICY IN AN AGE OF 'DEEP' REGIONAL AND GLOBAL ECONOMIC INTEGRATION

The much deeper forms of international economic integration that evolved from the 1990s onwards and that are well reflected in the economic literature on 'global value chains' or 'trading in tasks' (see Baldwin, 2011; Grossman and Rossi-Hansberg, 2008; Baldwin and Robert-Nicoud, 2014) changed fundamentally the role that international integration can play in countries' economic development, particularly in countries that are 'potentially catching-up economies' (PCUs). The new forms of international integration – the result of a major push towards trade liberalisation and pressures on governments to accept higher standards of law enforcement as well as much reduced transport and communications costs – have positive and negative implications for countries' possibilities to influence the pattern of economic development.

On the positive side, countries can now benefit from a much more 'granular' form of international specialisation (by tasks or production stages) as compared to the previous emphasis in the international trade literature on comparative advantages. That classic literature still formulated its insights with 'vertically integrated' industries in mind. The new cross-border integration along value added chains changes also the 'agents' that see advantages in, and can exploit the increased scope for, international specialisation. If specialisation proceeds by detailed stages of a globally or regionally integrated production chain, then this requires the capabilities of an organisation that can manage and administer the logistics of such integrated value added chains. These are *internationally operating enterprises*, typically referred to as multinational companies (MNCs), which are the 'agents' in that process.

Hence from an industrial policy point of view, the strategic agent dominating the pattern of industrial specialisation and affecting a country's position in the international division of labour, passes from either 'national champions' or 'national governments' to internationally operating firms.

This has advantages and disadvantages from the point of view of an individual (potentially) catching-up economy (PCU): the advantage is that these agents bring with them superior know-how in the areas of technology, marketing and also access to markets which the national firms might not possess. There will also be a shift from an emphasis on delivering to export markets a completed final product to supplying intermediary inputs or unprocessed inputs. The superior know-how could lead to substantive spillovers to the domestic economy and hence faster upgrading in the catching-up economy. Upgrading in this context may consist of product upgrading, process upgrading, functional upgrading or value chain upgrading (Humphrey and Schmitz, 2002; OECD, 2013). Irrespective of the exact type of upgrading, its

extent depends crucially both on the economy's ability to build up complementary 'absorption capabilities' (see Abramovitz, 1986 and 1994) as well as regulatory regimes, such as international property rights (IPRs) and domestic and regional competition policy.

The disadvantages could be two-fold: the shift of 'agency' means that national governments can play less of a comprehensive and direct role in steering the overall 'industrial development process'. Its role has to be more indirect: making sure that it provides 'essential inputs', accepts the responsibility to make the country attractive to be integrated in global or regional production networks (legal and other infrastructure, a tax regime which favours the attractiveness of locating production stages in its country, etc.) and overall accepts an 'open door' policy. The second 'disadvantage' lies in the vulnerability of a country's place in international production networks. If, for a variety of reasons, international firms decide to re-locate there is little that the government can do about it. Further, any shocks to international trade linkages will affect a country more strongly than if it were to produce vertically integrated products which it could reorientate towards the domestic or other export markets in case of a particular demand shock.⁴

We shall cover some specific features of the role of regional and global production networks (RPNs and GPNs respectively) in the European context in sections 4 and 6 of this paper.

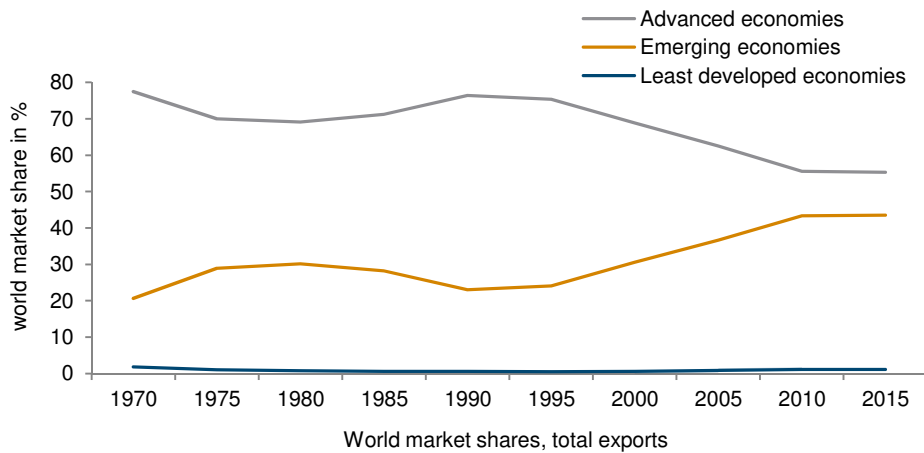
3. GLOBAL DIFFERENTIATION AMONGST (POTENTIALLY) CATCHING-UP ECONOMIES

One of the key features of the 'second wave of globalisation' (the first one being in the late 19th century; see e.g. O'Rourke and Williamson, 2000 and 2001) is the heightened role of emerging economies in world trade. This was to a large extent the result of shifts in economic policy in emerging countries towards more liberal trade and investment regimes. It occurred at different points in time and in different intensities. In China, for example, the liberalisations started at the end of the 1970s, with the country finally becoming a WTO member in 2001. India introduced first pro-market reforms in the mid-1980s but the reforms gained momentum only in the early 1990s with India joining the WTO in 1995. While in many cases, liberalisation efforts followed a piecemeal approach, the often 'managed' integration into the world economy led to a marked increase in the world export share of emerging and developing economies (Figure 1).

Interestingly, the long-term development of market shares in global exports does not show a smooth and continuous upward trend for the emerging economies. The upward trend starts only during the mid-1990s with an increase in market shares from 23% in 1995 to about 44% in 2015. The initially small share in global exports of the emerging economies and the Least Developed Countries (LLDCs) which together stood at 22% in 1970⁵ is remarkable if one considers that this broad group of countries represented roughly 80% of the world's population at that time.

⁴ In any case, in Europe there is little alternative for (potentially) catching-up economies (PCUs) than to accept the new 'rules of the game'. The EU market is very dominant for PCUs both within the EU as well as those countries outside the EU but closely linked to it economically.

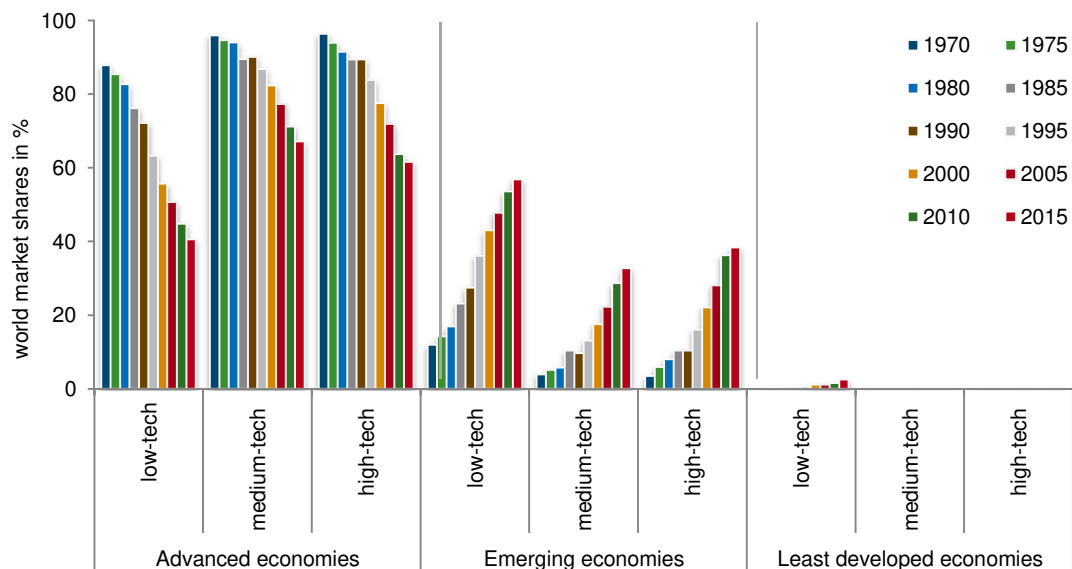
⁵ The shares are somewhat higher according to WTO merchandise trade data (30% in 1970 for emerging economies and LLDCs).

Figure 1 / World market shares, gross exports, 1970-2015

Note: Data based on SITC 2 product classification. Advanced economies according to IMF country classification (2016). Least Developed Countries according to United Nations (2016).

Source: CID NBER-United Nations Trade Data (1970-1990); CEPII BACI database (1995-2015); authors' calculations.

The situation of the advanced economies is basically the mirror image of that of the emerging economies. Their market share in global exports peaked around 1990 with more than three quarters of global exports originating from this group of countries.

Figure 2 / World market shares, gross exports, 1970-2015

Note: Data based on SITC 2 product classification. Advanced economies according to IMF country classification (2016). Least Developed Countries according to United Nations (2016). Classification of products based on SITC 2; technology groups according to Lall (2000).

Source: CID NBER-United Nations Trade Data (1970-1990); CEPII BACI database (1995-2015); authors' calculations.

Despite the impressive inroads that emerging economies have made in global trade since the 1990s, it should also be noticed that there is a considerable group of LLDCs which still remains marginalised when it comes to international trade, accounting for a mere 1.2% of global exports in 2015 – half a

percentage point less than in 1970. This insignificant market share is striking when considering that the LLDCs taken together have a population of nearly 1 billion, that is the 'bottom billion' (Collier, 2007), which makes them approximately as populous as the advanced economies.

The move into global markets by emerging economies documented in Figure 1 is tightly linked to their move into the production of manufactures. This is shown in Figure 2, which displays again export market shares, this time by technology intensity as suggested by Lall (2000) omitting exports of primary products and resource-based manufactures. Focusing on the emerging economies, it is obvious that their growing prominence in international trade is not due to their traditional role as exporters of primary goods but that their success extended into the production and exporting of manufactures. With regard to the sequence of market share gains, the expected pattern emerges: growth sets in first in the realm of low-tech manufactures and later passes on to medium-tech and high-tech products. While still more than proportionately represented in the trade of manufactures, the appearance of emerging economies in the global trade arena puts an end to the full dominance of advanced economies in the domain of manufacturing exports. Hence, the catch-up process of a rather large set of emerging economies also led to a slightly less unequal distribution of world market shares across trading partners with the Theil index of global exports declining from 1.56 in 1970 to 1.45 in 2015. Despite the fact that trade has become less concentrated on advanced economies, note again that the group of LLDCs remains largely excluded from trade in manufactures. Only a modest pick-up in world market shares in low-tech manufactures is observable from almost zero in 1970 to 2.6% in 2015.

3.1. Structural upgrading of exports

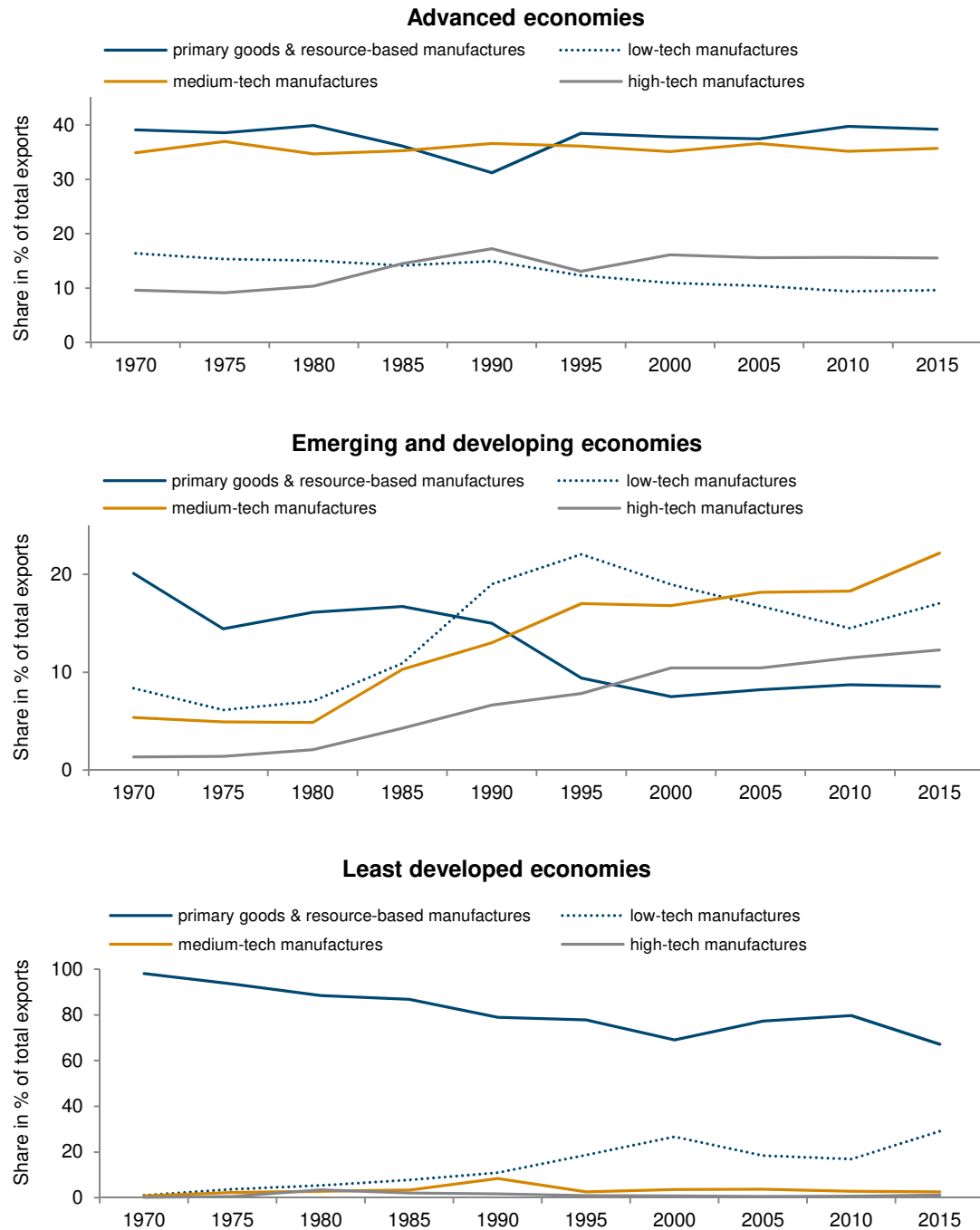
Taking a broader view including the analysis of exports of primary and resource-based manufactures, the catching-up process of the emerging economies is discernible in their export structures (Figure 3a). Reflecting the developments in world market shares, this group of countries as a whole shifted exports out of primary goods and resource-based manufactures into more technology-oriented manufacturing goods. In 1980 there is already a noticeable pick-up in the share of low-tech products⁶ that reached its peak in 1995. Soon after 1980 also medium- and high-tech manufacturing gained in importance. Around 1995 a significant number of large emerging economies already started to specialise increasingly in medium- and high-tech manufactures, leading to a relative decline in the share of low-tech products in exports. At about the same time, even some LLDCs managed to move slightly into low-tech manufactures, though at a very low level and with still an insignificant impact at a global level (see also Figure 2 above).

The structural pattern in Figure 3 for the emerging economies bloc are of course mainly due to the developments in South East and East Asian economies, with China as the most prominent and most important proponent (see the further breakdown by regional country groupings in Figure 3b, which also gives a further breakdown of primary and resource-based exports). For many South American countries, which includes large economies such as Brazil, the structural upgrading is less smooth due to their continued dependence on primary goods exports and related manufacturing exports. See also the strong dependence of Sub-Saharan Africa on primary goods exports. Moreover, the fact that a

⁶ There were a number of then emerging economies that started their structural upgrading much earlier but this is not visible in the data as these were mainly the Newly Industrialised Countries in South East Asia that, in Figure 3, are already classified as 'advanced'.

considerable number of emerging economies opened up during a relatively short period of time, also means that there is increased 'South-South' competition. As regards the Developing and Emerging Economies in Europe, we see that their export profile is more similar to that in South East and East Asian economies, but with a particularly strong position in medium-tech exports.

Figure 3a / Export structures by technology content of products, gross exports, 1970-2015

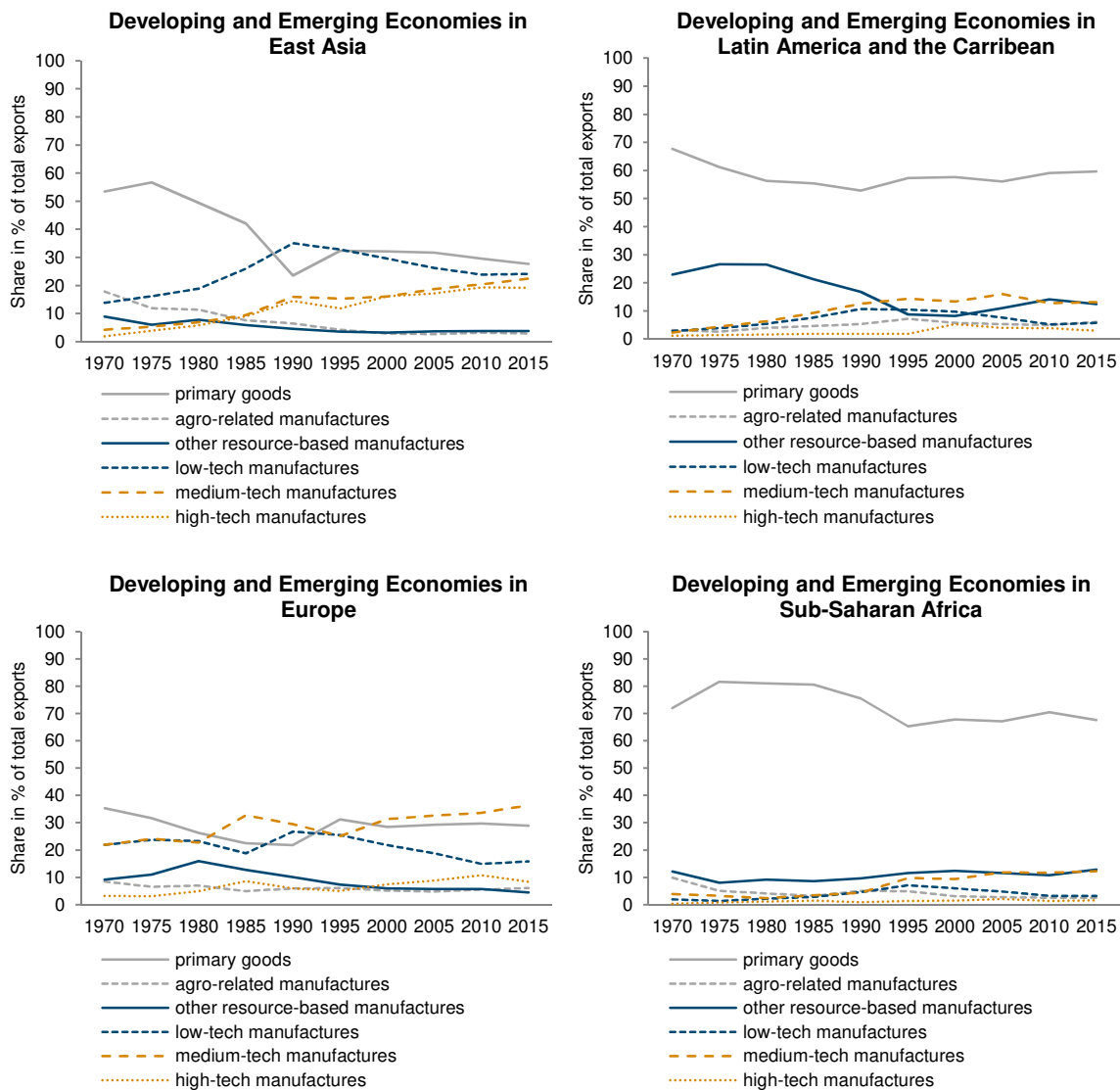


Note: Data based on SITC 2 product classification. Advanced economies according to IMF country classification (2016). Least Developed Countries according to United Nations (2016).

Source: CID NBER-United Nations Trade Data (1970-1990); CEPII BACI database (1995-2015); wiiw calculation.

An open question related to the broad developments in world trade is to what extent the successful emerging economies relied on market-oriented policies as prescribed by the Washington Consensus (which may – in an oversimplified manner – be summarised as privatisation, liberalisation and stabilisation) and to what extent it was due to state interventions and explicit choices to ‘defy’ comparative advantages (see Chang in Lin and Chang, 2009). This question was most intensively debated in the context of East Asian economies, such as Korea and Taiwan, without a uniform judgement arrived at for either of the two positions (Wade, 1992).

Figure 3b / Export structures by global regions



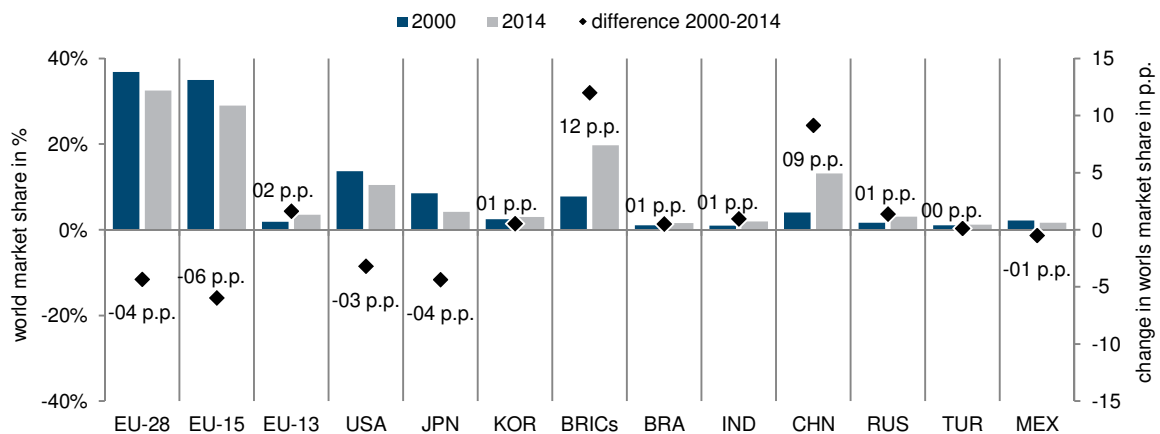
Note: Data based on SITC 2 product classification.

Source: CID NBER-United Nations Trade Data (1970-1990); CEPII BACI database (1995-2015); wiiw calculation.

3.2. Taking into account global value chains: the value added perspective of international trade

The emergence and intensification of international value chains make it harder to draw inferences from trade flows on the specific role of a country in the production of goods and services. This is due to the growing role of specialised parts and components and other intermediate inputs in countries' gross exports. In other words, the value of exports comprises an increasing share of value added originating from other countries. A famous example illustrating this phenomenon is the export of an iPod sold at a US retail price of USD 299 (Dedrick et al., 2010). The final assembly of the iPod takes place in China. However, the Chinese value added to the iPod which is shipped to the US at an ex works price of USD 150 is only USD 5. This represents only about 3% of the export value with the remainder of the value added coming from Japan, Korea, the US and others. To take into account the phenomenon of intermediates trade, inter-country input-output tables can be used to trace back the origin of value added. With geographically dispersed production and global value chains gaining ever more prominence, such value added based analysis of trade should give a better indication of countries' role in international trade networks.⁷ Figure 4 makes use of such a value added based approach and shows the world market shares of selected countries in terms of value added exports (Johnson and Noguera, 2012). Value added exports (VAX) is the part of a country's gross exports which consists of domestically generated added value which is absorbed by other countries. Thus value added exports 'corrects' for the foreign value added embodied in a country's gross exports.

Figure 4 / World market shares in value added exports (VAX), selected countries and country groups, 2000 vs 2014



Note: Value added of the total economy. Including intra-EU exports; EU-13 refers to the new Member States of the EU which have joined since 2004.

Source: WIOD (World Input-Output Database) 2016 Release; wiiw calculations.

An implication of Figure 4 is that the main results from the analysis of gross exports also holds when taking a value added trade perspective: emerging economies, above all China, have made strong inroads into global production and trade. In fact, of the 12 percentage point gain in world market share of the BRICs (Brazil, Russia, India, China) in terms of value added exports (including goods and services

⁷ The drawback of value added based analysis of trade is that it is much more data intensive, putting severe restrictions on the number of countries that can be analysed this way as well as on the time period that can be covered.

of all industries) between 2000 and 2014, about three quarters were due to China. This would suggest that the iPod example cited above is by no means representative of overall global trade relations. Instead, the value added perspective confirms the fact that several large emerging economies successfully integrated into the world economy. Naturally, the appearance of these new players in the global trade arena implied losses of world market shares on the part of the incumbent leading trading nations including the EU-28, the US and Japan. Among the established major trading nations, only Korea seems to have weathered the new competition from emerging economies and increased its world market share by 0.5 percentage points between 2000 and 2014.

Interestingly, with Mexico there is also a large emerging economy that suffered a decline in its world market share from a value added perspective. This is to some extent explained by Mexico's maquiladoras that typically add relatively little domestic value added. The very fast catch-up process of the BRICs reflected in the gains in global market shares provides evidence for the view that global value chains (GVCs) have the potential to support 'compressed development' (Whittaker et al., 2010). The huge advantage of geographically dispersed production is that countries can participate in manufacturing production more easily as it suffices to master a small segment of the production process without a need to acquire the whole range of capabilities needed for the production of a product (Collier and Venables, 2007). At the same time, the Mexican situation could indicate that integration into GVCs entails the risk of lock-ins in low valued added activities (Kaplinsky and Farooki, 2010) such as assembly.

The following section will focus on the situation of catching-up economies in Europe. In fact we shall look at all the low-/medium-income economies (LMIEs) in Europe and analyse their particular situation with respect to difficulties in the catching-up process and in the design of 'appropriate industrial policy' (AIP).

4. EUROPE'S CATCHING-UP ECONOMIES AND THE CASE FOR 'APPROPRIATE' INDUSTRIAL POLICY: THE MACROECONOMIC CONTEXT

In this section we shall continue our analysis of regional and global value chains (VCs) and look in more detail at the position of Europe's 'peripheral economies'. In fact, we shall cover all 'low-/medium-income economies' (LMIEs) in Europe, as one of the features that will emerge is that LMIEs are quite differentiated with regard to their participation in VCs. In the following we shall refer to the following groups of European LMIEs⁸:

- › CEE-5 (Poland, Czech Republic, Slovakia, Hungary, Slovenia)
- › BG,RO (Bulgaria, Romania)
- › EU-South (Greece, Portugal, Spain)
- › Baltics (Estonia, Latvia, Lithuania)
- › Western Balkans (Serbia, Macedonia, Montenegro, Bosnia and Herzegovina, Kosovo, Albania)
- › Turkey
- › Ukraine

⁸ There are more countries that could be classified as LMIEs (such as Georgia, Moldova, Belarus) but we shall exclude them from the analysis below.

In our analysis we shall point out that participation in VCs is a vital factor with regard to sustainable development processes particularly in the European context.

However, let us start with a more general discussion of the specific situation in which Europe's LMIEs find themselves:

First of all it is important to keep in mind that in Europe, particularly in the EU and countries closely integrated with the EU, we are dealing with an historically specific case of 'deep regional integration' (see Lawrence, 1996). This refers to a situation in which countries have come together within a much deeper form of institutional, legal and policy integration than is common in free trade arrangements (see also Sapir, 2011). The most striking feature is the 'four freedoms' associated with the Single Market defined by the free movement of goods, services, capital and labour. This goes along with a customs union (i.e. trade policy having been centralised at the EU level) and a centralised execution of competition policy oriented towards providing a 'level playing field' for all EU producers.⁹

We shall argue that the postulate of a 'level playing field' across the European economies and regions does conflict with the 'heterogeneity' of developmental states and other aspects of differentiation of European regions and countries and thus stands in the way of an 'appropriate industrial policy' (AIP). It is important that differentiated characteristics and developmental needs of countries and regions within the EU and in its neighbourhood are recognised in the context of the Single Market arrangements in order to be able to design and implement an AIP – more on that in section 5 below.

Secondly, when we look at Europe's LMIEs we should point out certain commonalities, whether they are inside or outside of the EU or the EMU. Most of them have chosen a type of fixed exchange rate regime, in the extreme case full EMU membership, in other cases a high degree of euroisation, at times a currency board regime and, further down the line, various forms of 'pegged' exchange rate regimes.¹⁰ The experience so far has been that, having chosen this type of exchange rate regime, it turned out to be very difficult to avoid the developments of unsustainable external imbalances.

We shall explore this point further in the following, as we shall emphasise that making room for an 'appropriate industrial policy' (AIP) will be essential to avoid catching-up processes of European LMIEs being interrupted or being reversed by severe adjustment crises, as has happened during the recent financial and economic crisis. In fact, recent experience indicates that such interruptions and reversals result particularly from the build-up of external imbalances (see also Landesmann and Hanzl, 2016).

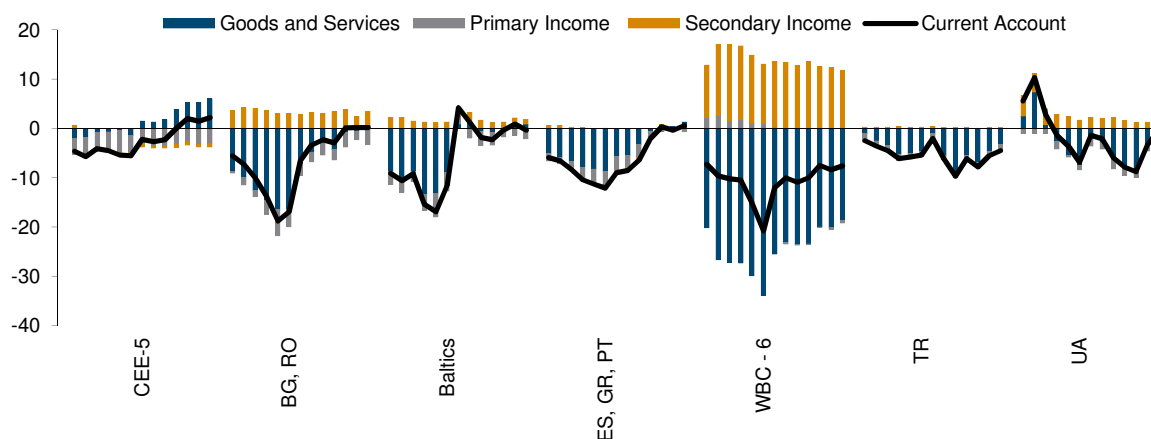
What we see in Figure 5 is that almost all of the LMIEs have incurred very substantial current account deficits in the period leading up to the recent financial crisis with the one exception being the CEE-5. This latter group managed to keep the current account deficit prior to the crisis at a (sustainable) level of about 5% of GDP while the other groups of European LMIEs experienced sharply deteriorating current account deficits prior to the crisis, in some instances reaching 15-20% of GDP per annum.

⁹ The most noteworthy aspect within the field on competition policy is the fact that EU members agreed to have their state aid programmes monitored by the European Commission which is entitled to prohibit such programmes if they are in violation of EU rules. This is the case in particular when measures distort or threaten to distort competition within the Single Market.

¹⁰ For a discussion of the variety of exchange rate regimes used in LMIEs, see e.g. Becker et al. (2010); Mussa et al. (2000).

The other issue that emerges from Figure 5 is that developments in the current accounts were mostly driven by the trade accounts, i.e. the difference between exports of goods and services minus the imports of goods and services. This means that the weakness of the current accounts prior to the crisis reflects the weakness of the tradable sectors in those economies that incurred high current account deficits. Again, the exception is the group of CEE-5 that managed to close the gap in the trade accounts before the crisis and the deficit in the current account was then entirely due to the income accounts, mostly reflecting profits earned by multinational companies.¹¹ Hence the evidence is that all LMIEs in Europe showed significant weaknesses in the competitiveness of the tradable sectors with the exception of the CEE-5 group that managed to achieve balanced trade accounts even though, like most of the other LMIES, they also achieved growth rates that exceeded those of their main trading partners in the EU.

Figure 5 / Composition of the current account of the balance of payments, 2003-2015, in % of GDP



Remark: Components refer to BOP 6th edition as far as available, BOP 5th edition before. Goods and Services refers to the trade balance in goods and services; Primary Income refers to Income Accounts; Secondary Income to current transfers.
Source: wiiw Annual Database incorporating national and Eurostat statistics.

The analysis of the current accounts and the importance of the tradable accounts therein suggest that (non)sustainability of catching-up processes in the (integrated) European economy is particularly related to the positions and strengths or weaknesses of the tradable sectors in LMIEs. In the following we want to show with a number of indicators that such differentiated situations of the different LMIEs are also related to their different positions in international value chains (i.e. VCs).

In Figure 6 we use again information contained in the WIOD database in order to produce evidence of a strong 'agglomeration' tendency of European manufacturing in what we call the 'Central European Manufacturing Core' (CEMC) (see also Stehrer and Stöllinger, 2014). The CEMC comprises Germany, Austria, Switzerland as well as the CEE-5.¹² In value added terms, the CEMC accounted for about 45% of value added embodied in overall European exports (i.e. in goods and services) in 2014, up from about

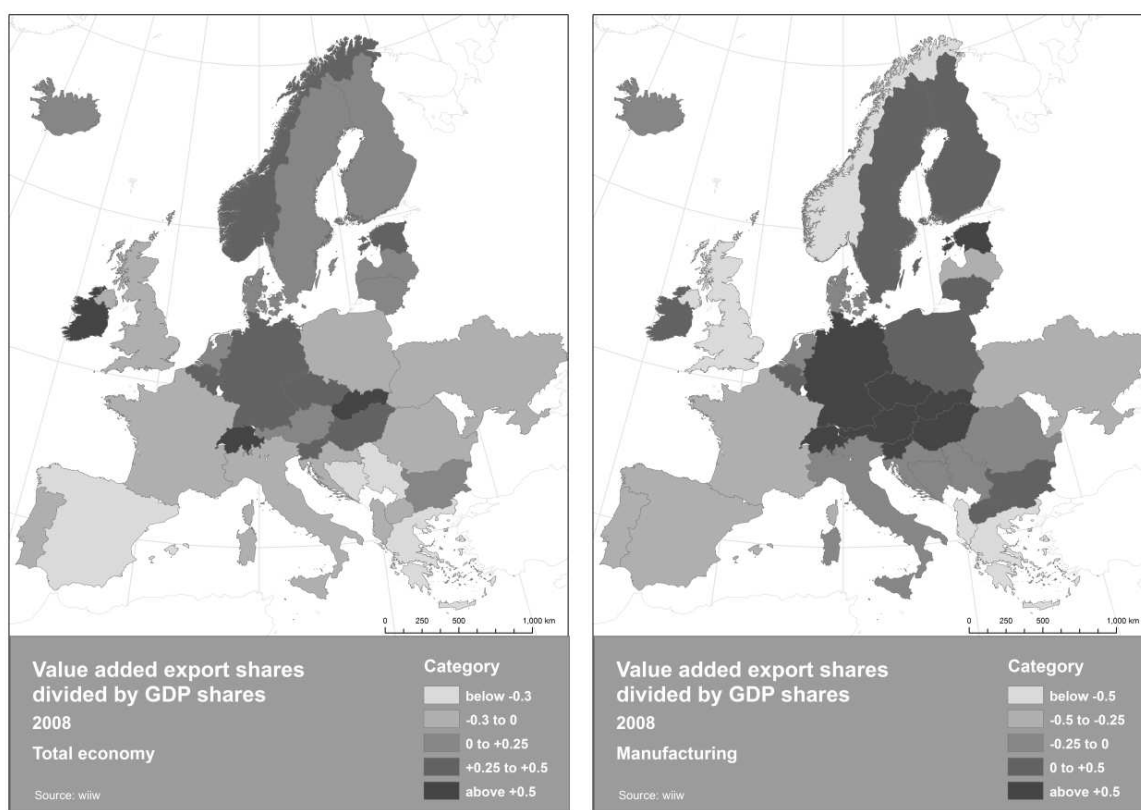
¹¹ Profits made by multinational companies that are non-residents count as outflows in the income accounts irrespective of whether these profits are repatriated or reinvested in the country.

¹² One might also add Northern Italy to the CEMC as many companies in Northern Italian regions are linked to cross-border production networks, organised by German and other 'Northern' manufacturing firms.

38% in 1995. Hence exporting activity in Europe as a whole is increasingly accounted for by the Central European economies and manufacturing plays a very dominant role in Central Europe's strong position in overall trade. This strong agglomeration of European manufacturing activity in Central Europe and its link to overall export performance is clearly visible from Figure 6 where the ratio between a country's contribution to European exports (in value added) is shown relative to that country's share in European GDP.¹³ Hence this ratio shows the importance of this country in Europe's exporting activity as compared to its share in European GDP.¹⁴ The left-hand side of Figure 6 shows these ratios for overall exports, while the right-hand side shows them for manufacturing.

Figure 6 / Contributions of countries to 'Wider Europe' exporting activity

(left side: to total exports; right side: to manufacturing exports) – contributions set relative to countries' shares in GDP



Source: wiiw Annual Database incorporating national and Eurostat statistics.

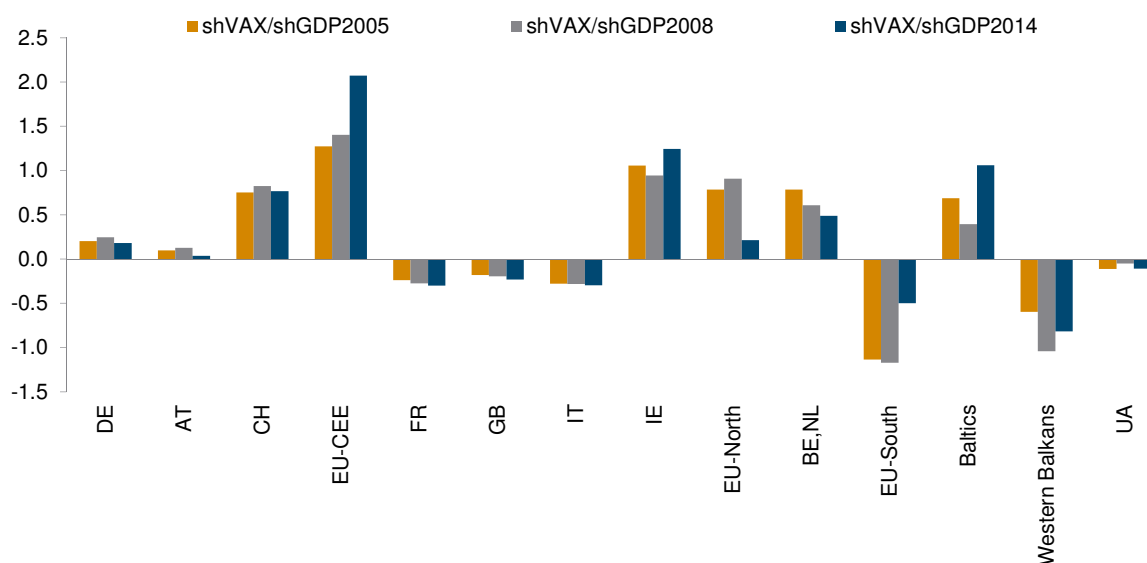
We see that a country's broadly over-proportionate contribution to exporting activity as a whole in Europe (left-hand figure) is linked to its relative strength in contributing to manufacturing exports (right-hand figure): the 'Central European Manufacturing Core' (CEMC) sticks out in this respect with the dark

¹³ We define here 'Europe' as including all the countries that are shaded in Figure 7.

¹⁴ Remember that VAX calculates direct and indirect value added contributions by all sectors of an economy not only towards its own exports – using input-output information – but also towards the exporting activity of other European economies – using the constructed 'world input-output tables (WIOT) provided in the WIOD database. The VAX indicator was introduced by Johnson and Noguera (2012). For details on the calculation of the VAX indicator see also Stehrer (2012).

patches, i.e. an over-proportionate presence in Europe's exports as compared to GDP. There are some other countries that show such a relatively strong contribution to manufacturing exporting activity such as Ireland, Belgium and Estonia, and there are some countries which make up for a very weak performance in manufacturing by doing relatively well in other tradable sectors: the United Kingdom with its strong tradable business and financial services sector is one and Norway with its strong petroleum sector is another. But it is also clear that under-performance of a wide range of countries, amongst them clusters of LMIEs (Southern Europe, Western Balkans, Ukraine, etc.), in their contributions to exporting activity (and this mostly linked to their weaknesses in manufacturing) is an important feature of the European economy. This is what lies behind what we would call 'structural external imbalances'¹⁵ in the European economy. It is a feature that – in our view – has proved very detrimental during the recent economic crisis and will continue to challenge the European integration process as a whole, as adjustment processes which are the consequence of such imbalances can cause very high economic and social costs.

Figure 7 / VAX shares relative to GDP shares of different European countries and country groups



Source: wiiw Annual Database incorporating national and Eurostat statistics. WIOD, own calculations.

Figure 7 uses the same indicator as Figure 6 to account for different countries' and country groups' 'value added contributions' to overall 'Wider Europe's' exporting activity' and shows this indicator for three different years: 2005, 2008 and 2014 (the last year for which the recent release of the WIOD database provides information). We see in this figure not only persistent 'surplus' and 'deficit' countries as regards their contributions to overall European exporting activity, but also the dynamic of these contributions over the years.¹⁶ Particularly remarkable is the dramatic increase of the CEE-5

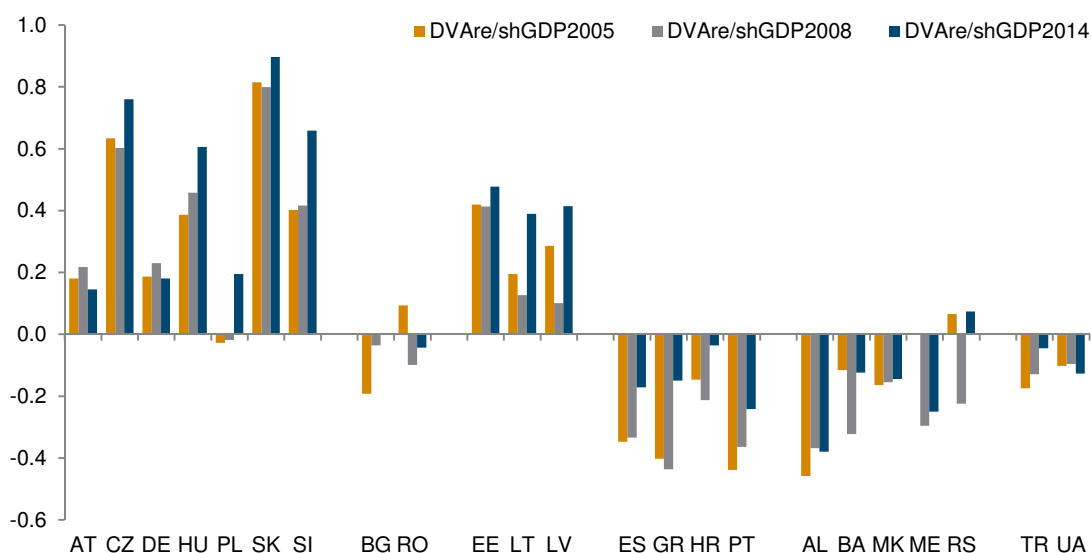
¹⁵ We use the notion of 'structural external imbalances' to denote persistent weaknesses in the current account positions of countries. These imbalances might not be apparent in periods when economies contract such as during the recent economic crisis and/or when such economies are subject to a 'sudden stop' (see the earlier Figure 5 for the period following the financial crisis in 2008) or when weaknesses in the tradable sectors require continuous depreciation in the real exchange rates that implies real income losses relative to their trading partners.

¹⁶ Setting the VAX shares relative to GDP shares defines here 'surplus' and 'deficit' countries, i.e. whether a country contributes (in value added terms) more or less to overall European exports than it does to overall European GDP.

contributions over this period and the deteriorating positions of the West European advanced economies (France, UK, Italy, BeNe, and EU-Northern economies during the crisis period). Very strong are the contributions by Switzerland (CH) and Ireland (IE); the contributions by Germany and Austria remain in the positive terrain. The dynamic of the Central European Manufacturing Core is thus borne out for overall European export. Ireland and also the Baltic countries join with strongly positive contributions to overall European exports; the former with its strong presence of multinationals and the latter with their strong connections with Scandinavian countries through regional production networks (RPNs).

Apart from the weak positions of advanced Western European countries, we also see the persistent **'deficit' positions of the Southern EU countries, the Western Balkans and Ukraine**, i.e. all LMIEs that are not well anchored in cross-European production networks and thus contribute less in value added terms to overall European exports than they do to European GDP.

Figure 8 / Shares of European LMIEs in cross-border production networks (divided by their shares in European GDP) – 2005, 2008 and 2014



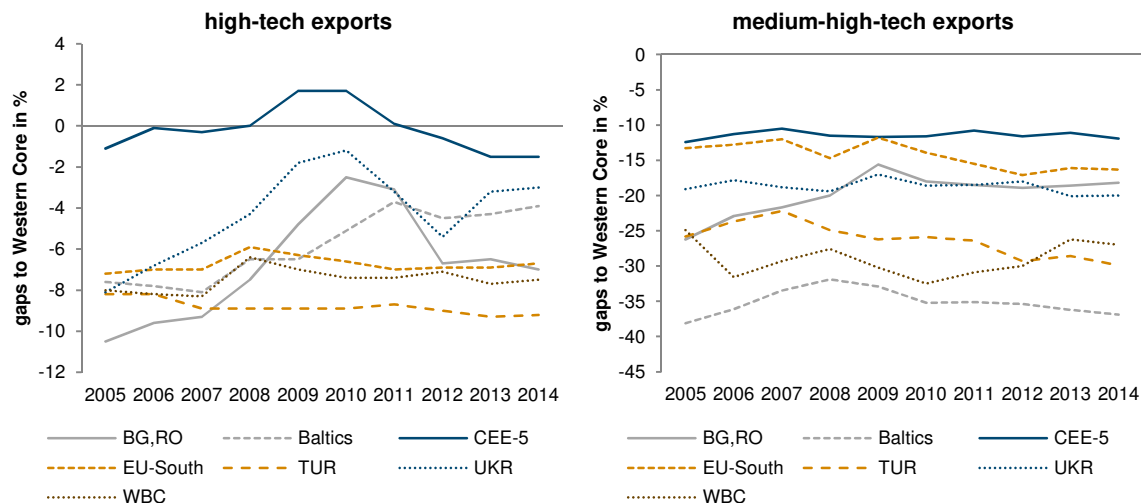
Note: The indicator DVAre refers to cross-border production linkages, with a country's trade flows – measured in value added contributions – crossing at least twice a country's borders; for details see Friesenbichler et al. (2017; Chapter 4). Source: wiiw Annual Database incorporating national and Eurostat statistics. WIOD, own calculations.

Figure 8 adds another indicator regarding the different European LMIEs' involvement in global production networks. The DVAre (domestic value added contribution to international production networks) indicator looks at value added content to trade flows when such trade flows cross the domestic border at least twice, i.e. intermediate inputs being either imported into the country and then final goods or further processed goods being exported, or exports of intermediate inputs that then return as (further processed) intermediate inputs or as final goods. Again, these calculations have been made on the basis of the WIOD database; for further details see Friesenbichler et al. (2017; Chapter 4). Just as with the VAX indicator, Figure 8 'normalises' the shares in 'Wider Europe's DVAre' by dividing them by the country's shares in Wider Europe's GDP, so that we can see whether a country is over- or under-proportionately involved in global production networks compared to its weight in GDP. The evidence presented in Figure 8 supports the hypothesis that there is strong differentiation across Europe's

LMIEs¹⁷ with the CEE-5 and the Baltic countries having an above-average representation in IPNs and the other European LMIEs an under-representation; Bulgaria/Romania and recently also Serbia (RS) show an about average representation in GPNs.

Let us add some further information on ‘vertical differentiation’ across European LMIEs with regard to their respective positions in European industrial production. In Figure 9 we show the VAX shares of more advanced industrial sectors in the different countries’ overall value added exports¹⁸ and these shares were compared to the shares of these industry groups in the advanced West European countries¹⁹ value added exports. Thus, a value of -0.2 would mean that the VAX share of a particular industry group, say, medium-high tech exports, would be 20% less in a country group than it is in the advanced country group.

Figure 9 / VAX shares of LMIEs in ‘Wider Europe’ – in high- and medium-high-tech industries; gaps relative to advanced West European economies (=0.0)



Source: WIOD, own calculations. Tech classification: high: pharmaceuticals (CF), computer, electronic and optical industry (CI); medium-high: chemical industry (CE), electrical equipment industry (CJ), machinery and equipment industry (CK), motor vehicles industry (CL). Industry codes according to NACE Rev. 2.

Figure 9 shows clearly a vertical differentiation amongst Europe’s LMIEs and, furthermore, an interesting dynamic over the period 2005-2014: Among the European LMIEs, the CEE-5 group of economies have closed or almost closed the gap in the VAX shares of high-tech and medium-high-tech industries compared to advanced West European economies. We see also an increase – from a low position – in the shares of these two industry groupings in Bulgarian and Romanian VAX, as well as a strong upgrading of Baltic countries’ presence in the high-tech industries but not in the medium-/high-tech industries. This might reflect the fact that the Baltic countries do less well in motor manufacturing as well as in mechanical engineering industries in which the CEE-5 show a strong revealed comparative advantage. There is evidence of a ‘falling behind’ of the Southern EU economies, of Turkey and Ukraine

¹⁷ Austria and Germany are also shown in Figure 8 as partner countries in the ‘Central European Manufacturing Core’.

¹⁸ The shares of all industry groupings for any country add up to 100%. The other industry groupings not shown in Figure 9 are medium-low- and low-tech industries.

¹⁹ West European Core countries refer here to Germany, France, Austria, Belgium and the Netherlands.

regarding the medium-high-tech industries that played such an important role in the industrial upgrading process of the CEE-5 over the past two decades.

The above has thus emphasised that there are actually two aspects to a successful integration into value chains: one, finding a place in VCs in the first place and, two, managing a gradual upgrading process within such VCs.

This section has addressed the core critical issue of ‘external imbalances’ in the European economy and linked it to the uneven spatial dispersion of tradable capacities across the European economic space. This leads us to discuss the need to reconsider the importance of ‘industrial policies’ in Europe and also more widely in the global economy, concentrating on the case of ‘potentially catching-up economies’ (PCUs) and thus developing the notion of ‘appropriate industrial policy’ (AIP).

5. TOWARDS AN ‘APPROPRIATE INDUSTRIAL POLICY’ (AIP) FOR PERIPHERAL AND POTENTIALLY CATCHING-UP ECONOMIES (PCUs)

We now want to develop the notion of ‘appropriate industrial policy’ (AIP) for different sub-groups of economies – differentiated by criteria developed below. Given the emphasis we have put on external imbalances endangering the catching-up processes in PCUs, we shall use the term ‘industrial policy’ in the sense of policies favouring the tradable sector overall²⁰.

What are the arguments for ‘appropriate industrial policy’²¹? Can we develop a taxonomy that makes the type of industrial policy dependent on certain characteristics of an economy, such as:

- › Level of technological development
- › Size of economy
- › Geographic location (landlocked, access to sea, to transit routes, etc.) and other location factors: near to/far from advanced/high-income economies; member of regional trading bloc
- › Raw material and environmental endowment: ease of specialisation in commodity production and in tourism
- › Good/bad institutional/legal structures; behavioural deficiencies (lack of trust; corruption etc.); state of political economy leading e.g. to concentration of power/ownership of industry

In the development of an ‘appropriate industrial policy’ for Europe and its neighbourhood, we have to recognise the differentiated positions in which countries and regions find themselves. The choice of industrial policy instruments depends on taking account of these differences. This also implies that EU rules have to make allowance for the differentiated needs of policy instruments. As mentioned earlier, we shall argue that the postulate of a ‘level playing field’ across the European economies and regions

²⁰ Within the tradable sector we can further differentiate with respect to certain criteria, e.g. segments that are more prone to productivity advances, skill demand or skill upgrading, advantages of economies of scale, etc. Furthermore, policies supporting the tradable sector also mean support for activities and ‘platforms’ that support directly or indirectly tradable sectors or sector segments. Such ‘platforms’ include physical infrastructure, legal and institutional support, training and educational activities providing for a skilled workforce and management, etc.

²¹ For other attempts to develop concepts of industrial policy that take account of differences in development levels and specificities of the European regional context, see Török (2007), Aiginger (2013), Bartlett (2011), Percoco (2013), Teixeira et al. (2014), Radosevic et al. (2017).

does conflict with the 'heterogeneity' of developmental states and other aspects of differentiation of European regions and countries and thus stands in the way of an 'appropriate industrial policy' (AIP). It is important that differentiated characteristics and developmental needs of countries and regions within the EU and in its neighbourhood are recognised in the context of the Single Market arrangements in order to be able to design and implement an AIP.

Before coming to the specific characteristics that would guide AIP in the European Union and in its neighbourhood in section 6 of this paper, we shall discuss the general logic behind the use of different industrial policy instruments that take account of different situations of countries and regions:

Level of technological development: Aghion et al. (2005) have pointed to the differences in industrial and particularly technology policy that would be appropriate for countries that are 'close' to or 'further away' from the 'technology frontier'. Close to the technology frontier, a country has to rely in part on its own capacity to generate new inventions and innovations. The emphasis of industrial policy instruments will be to build up an efficient (public and private) R&D sector and make sure business-government collaboration is efficiently used to guarantee spillovers from publicly financed R&D activities. It will streamline educational and training activities so that the human capital needs for an innovative economy are well satisfied, and the finance sector is organised to provide capital to new, innovative start-ups. Apart from that, the innovation system will be open to international collaboration at all levels: students' and researchers' exchanges as well as joint research programmes and an interest in the ease of mobility of professional and managerial staff. An economy close to the international technology frontier will also be quite concerned about intellectual property protection that will be in the interest of the country's innovative firms.

For countries that are further away from the technology frontier, the interest lies in exploiting the 'advantage of backwardness' (Gerschenkron, 1962), i.e. the important thing here is to facilitate 'technology transfer' and adapt imported technology to the requirements of the country's development level. In this context, policies aimed at maximising the 'absorptive capacity' with respect to foreign technology are important. A longer-term strategy to follow an appropriate route towards a dynamic evolution of a country's position in the international division of labour should be adopted. Especially for small economies, the international linkages are particularly important (see the discussion between Lin and Chang, 2009). There are potential conflicts of interest with respect to international property rights (IPRs) as catching-up economies would like to maximally gain from a quick diffusion of an evolving pool of innovations at the global level. However, for the group of catching-up economies as a whole one has to be aware of the impact of a weakening of IPRs on the incentive to invest into R&D in advanced economies and thus on the speed of inventions and innovations. There is a clear coordination issue here, which negotiations within the WTO are trying to address.

Size of economies matter: Small economies are, ceteris paribus, more open economies, i.e. more dependent to do well in international markets. It is obvious that small economies are more vulnerable with respect to the state of the current accounts. This is for a number of reasons: (i) less control of capital inflows and outflows, thus even under flexible exchange rates, much less room to manoeuvre for monetary policy. (ii) The domestic market is small and hence the interests of international investors will be more geared towards either involving the country as an export platform or making sure that the country gets integrated into production networks that include a variety of countries. Also on the demand side, it will be important that the country sees itself as well integrated into a regional market beyond its

borders. As FDI and export activity involves significant fixed costs (see e.g. Melitz, 2003; Helpman, 2006) attraction to sell to or be active in a particular market will depend on its size; hence low regional trade barriers and good regional transport and logistics infrastructure will be important to make small countries attractive both from the supply (production location) and the demand side.

For large economies, other dangers have proved historically to be important: there can be too much incentive to rely on the domestic market. Thus India for a long time after independence relied on the domestic market that was protected by high import restrictions. This meant that Indian producers did not make much of an effort to succeed in more challenging export markets. Once trade liberalisation set in, Indian companies showed that substantial supply-side potential existed and they were performing quite well in export markets, including in sophisticated product and business services areas (see e.g. Felipe et al., 2010). The Indian strategy differed substantially from the one in post-war Japan, and then in East Asia more generally where the challenge of exporting to high-income markets was taken up early on, supported by a courageous industrial strategy.²² This proved highly successful, was executed in differentiated ways across South East Asian economies and was also followed by China from the mid-1980s onwards. These examples prove that a combination of supporting initial industrialisation and upgrading processes through a variety of trade and industrial policy measures (often going counter to ones that aim at something resembling a perfect competition strategy), combined with strong incentives to do well in difficult export markets, can be key to a successful upgrading strategy.

Raw material endowment: There is a large literature on the 'natural resource curse' (see van de Ploeg, 2011). How to avoid a 'resource curse'? It is important that dependence on the raw material base diminishes through a variety of measures: (i) political economy: avoid a high concentration of ownership in the raw material sector as it generates a very unhealthy dynamic of 'oligarchic capture' of economic policy as a whole. (ii) Build up 'endowments' and 'assets' which support an economy to diversify its economic structure away from the raw material base. This includes a knowledge and human capital base etc. that would shift its comparative advantage away from a singular dependence on raw materials. Openness to knowledge transfer, FDI and mobility of (especially qualified) labour (see Gulf states) would assist to build up 'complementary assets'. (iii) Use the raw material base as an opportunity to move 'upstream' into processing and the higher value added segments of a production chain (e.g. refining, petroleum products; chemicals; wood processing, furniture, paper products, etc.) (iv) In the case of 'exhaustible resources', follow a well-conceptualised policy of timing of resource exploitation as well as adopt counter-acting demand- and investment-side policies that avoid or moderate the negative impact on other (potential) tradable sectors and that, on the contrary, can contribute towards the diversification and upgrading process of the economy.

Geographic factors: Obviously, a country's geographic location cannot be changed. However, one can (i) use transport and communications technology to reduce the importance of a detrimental geographic location. (ii) Use the diversity of specialisation options in today's industry to overcome the negative aspects of a detrimental geographic location, e.g. produce goods or specialise in 'tasks' where transport costs are low or where transport takes place in 'virtual space' (e.g. telecommunications transmission). Sometimes one has to accept an over-proportionate engagement of the qualified domestic labour force in such activities that do not represent a country's 'average endowment structure'; e.g. developing a highly developed software or medical services supply industry in a country such as India. (iii) Regional

²² The opposite strategy was followed in post-war Latin America.

cooperation is also very important here as individual countries' location disadvantages can be overcome through a cross-regional effort to build up regional transport infrastructure. In this way a country which is originally 'land-locked' or peripheral in its location gains access to international transport facilities, even becomes a hub (air, telecom) itself and thereby enlarges its opportunity set regarding location advantages for new production activities.

Institutional quality: One has to accept that countries at different levels of economic development also have differentiated maturity in the quality of institutional capacities and in the characteristics of their institutions. This does not mean that nothing can be done about these institutions, but one has to accept that institutional quality correlates with different development levels (see Khan, 2012). Hence when one designs 'appropriate industrial policy' one has to take account of these differences, rather than assume that a less developed country can count on institutions of the same quality as more advanced economies. 'Appropriate industrial policies' thus have to be tailored to the quality of institutions linked with different stages of economic development (e.g. one has to accept that the bulk of civil servants will not be paid a high salary and will thus be prone to accept bribes). Another issue that has proved to be of importance is the quality of local authorities that in many areas are executing industrial policies on the ground. Here, experience has shown that there can be substantial location competition across the regions of the same country and an important factor in such location competition can be the quality (effectiveness, legal reliability, transparency in project vetting and approvals, etc.) of regional administrative bodies involved in industrial policy. The success of such authorities in one locality can have a significant 'demonstration effect' on the quality of local authorities in other regions (examples from such different economies such as India and Poland abound).

A matrix representation of country differentiation and 'appropriate industrial policy: In Matrix 1 we have tried to put some of the aspects discussed above in the form of a matrix which shows country characteristics on the vertical axis and five areas of an 'appropriate industrial policy' on the horizontal axis. The matrix representation is at this stage simply a heuristic – and in many ways simplified – device to emphasise the importance for industrial policy uses to adjust to the differentiated situations of countries and regions.²³ The elements of the matrix then point in the direction of the appropriate industrial policy instruments to be adopted in the light of the country's/region's characteristics and the selected policy areas. We distinguish the following country/region characteristics:

- › its level of technological development as evidenced by its overall level of productivity
- › its size
- › the natural resource base
- › geographic location characteristics (divided into (i) natural transport connections and (ii) being close to/far from high-income/high-productivity countries or regions)
- › political economy characteristics: institutional/legal standards

²³ In fact, the matrix should be expanded into more dimensions, as any combinations of characteristics could be envisaged as representing the situation of a particular country (or region) and the suggested mix of industrial policy instruments should adjust to these. This is very much in line with the point of the 'appropriateness' of industrial policies which we advocate, as it should fully take into account the differentiated nature of conditions in which countries or regions find themselves. However, as we develop the notion in this paper at a heuristic and not yet operational level, we restrict ourselves to discussing just a few examples of characteristics-AIP combinations in this two-dimensional matrix representation.

Matrix 1 / Country characteristics and 'appropriate industrial policy'

Characteristics (column titles)		Policy areas (rows titles)				
		Technology policy	Labour/Human Capital	Finance	Industry/Competition	Infrastructure
Technology/ productivity level	high	Internationally connected innovation system	High-level STI personnel, research centres; life-long learning	Venture capital finance	Incumbents need to be challenged: encourage new entrants	International connectivity
	middle	Spillovers to domestic capabilities	Vocational training, international and national mobility	Support for domestic new entrants; bank-based finance	Cluster policy; importance of FDI and spillovers	Link up with IPNs: transport & communications
	low	Absorption capacity building	Generalised literacy; vocational training: counter-act dramatic brain drain	Development banks: longer-term financing facilities	Attract both MNCs and support spillovers	Improve national, regional and international connectivity
Country Size	big	Diversified innovation activity	Wide-ranging human capital build-up	Rely on diversified financing institutions	Avoid concentration on few incumbents	Intra-country connectivity important as well as international
	middle	Emphasise international interlinkages	Inter-leaving with international expertise	Foreign banks complemented with domestic financing institutions	Mix of strong domestic companies and new entrants	Diversify to a few, territorially spread 'connectivity centres'
	small	Specialised areas of technology expertise	Importance of complementarity of foreign and domestic expertise	Focus finance on bottlenecks for domestic development needs	Some focus on build-up of a small set of large companies permissible	Regional and international inter-connectivity important
Raw material base	rich	Build up know-how in processing stages; diversify in neighbouring industrial fields	Training of personnel to support upgrading and diversification	Avoid collusion of financial institutions in rent-collection	Strict monitoring of pricing, investment and upgrading plans	Support transport and sourcing links
	low	R&D support focused on sectors in which technology and skill development potential is high	Create niches in 'tasks' of comparative advantage based on labour resources and skills	Promote build-up of sector-specific financing know-how; specific agencies	Allow entry/exit in established and new fields of C.A.; develop strongholds in some tradable industries to avoid excessive external imbalances	
Geographic location (i)	land-locked; removed		International mobility should be strongly encouraged; however, support 'return' schemes to avoid 'brain drain'	Encourage openness to foreign banks	Specialisation in fields with relatively low physical transport costs	Emphasis on transport and communications infrastructure essential
	sea-access; central		Tailor vocational training and higher education to needs of locational C.A. industries	Liberalised financial services sector could complement C.A. in trading and other service activities		Exploit locational C.A. industries including related service activities
Geographic location (ii)	near HI markets	Interact in technology fields depending on level	Frequent training, research stays in HI; encourage 'brain circulation' schemes	Keep some domestic complementary finance capability	Carefully focus on fields of specialisation and (cross-border) integration; exploit locational C.A. industries including related service activities	Facilitate cross-border linkages
	far from HI markets	Use channels of interaction: FDI, researcher mobility, etc.	Build up longer-term training & research collaborations; tailor vocational training and higher education to needs of C.A. industries	Encourage international financing linkages	Encourage linkages: EPZs, IPNs	International connectivity important
Political economy: Institutional/legal standards	low	Try to insulate specialised, priority areas from low legal, institutional standards	Build up meritocratic, well-resourced special training and educational institutions	Greater power to regulatory and supervisory bodies; external monitoring agencies	Improve monitoring by competition authority and widen its powers	Specific supervision of infrastructure projects; with assistance of foreign donors
	medium	Apply above-average legal protection to a range of prioritised innovation fields	Ensure funding for diverse higher-quality educational & training institutions	General tightening of regulatory and supervisory mechanisms	Transparent scrutiny of public enterprise accounting and performance	Strengthen monitoring, execution and auditing of infrastructure projects

Note: STI= Science, Technology and Innovation; HI= high income; MNC= multinational companies; IPN= International production network; C.A.= comparative advantage; EPZ= export processing zones.

As regards policy areas, we distinguish:

- > technology
- > educational/training, mobility policies
- > finance
- > competition policy
- > infrastructure

We could extend this list of characteristics and policy fields, but the representation of AIP considerations should be illustrative rather than comprehensive. We shall therefore discuss the (cell) entries in this matrix only selectively.

To take an example, it is obvious that the aim of technological development can (and has to) be pursued in different ways by countries that are characterised by *high or low starting levels of technology and productivity* (top rows of the matrix): a country with a low level of technological abilities has to focus on benefiting from technology transfer. For this it is important to build up 'absorption capacities' of technological know-how generated abroad. This amounts to focusing on the development of literacy (numerical and otherwise) and vocational skills for a significant share of the labour force so that imported technology can be utilised in the country. Another important source of technology transfer is foreign direct investment as internationally operating firms not only have proven levels of technological know-how, but also advanced organisational structures and knowledge of and access to a wider range of markets than local producers. All of this is relevant for a country with low initial levels of technological know-how to benefit from technology transfer. A country with a medium level of technological know-how can continue to benefit from the superior know-how of internationally operating firms, but should also make sure that spillovers to domestic producers take place. This can be done through support for collaborative R&D programmes, financing support for spin-offs of new domestic enterprises by staff that benefited from having gained experience in foreign enterprises etc. Further, a country with a medium level of productivity will attempt to build up the quality and size of its own domestic innovation system, but also try to benefit from international cooperation and the mobility of researchers, international experience of managers, etc. For a country that has already reached a high technological level, the ambition has to be to participate in the advancement of the international technology frontier, allow experimentation by new start-ups, providing them with venture capital, making sure that high quality of scientific training can be obtained either in domestic or international research institutes and universities etc. Thus the 'appropriate' technology policy obviously differs across countries and regions with different starting levels of technological know-how.

Taking another example from the matrix regarding countries with *low or medium levels of legal and institutional standards* (bottom rows): here it is important to acknowledge that it would be unrealistic to expect a country with generally low levels of legal and institutional quality to quickly achieve improvements across the board in these standards. Hence what we are advocating here is a targeted approach: This refers to providing special resources to specific areas of scientific and technological expertise, to specific training and educational institutions, and monitoring the use of such resources carefully. Similarly, above-average quality infrastructure should be provided to support particular industrial activities and/or specific regional locations. Such activities and locations would also get the specific attention of public institutions (such as from the competition authority, development banks or export support institutions) so that these priority areas get prior attention to improve the institutional and

legal climate. The success of such priority activities and regions could then have a demonstration effect on other sectors, regions and educational and training institutions which will thereby be induced to compete for additional resources to improve their institutional and legal infrastructure and performance. For countries that have already achieved a medium standard of legal and institutional infrastructure, the range of activities and localities selected for specific improvement would be widened: the intervention by public authorities would be carefully monitored and tailor-made improvements in the institutional and legal infrastructure would be suggested and implemented. This refers to the range of training, educational and scientific institutions, of policy-making and regulatory bodies in the fields of finance, competition authority, and public utilities where the attention of legal and institutional improvement will cover a wider range. The point of this differentiated and targeted approach is to avoid an 'over-reach' that would only lead to very meagre overall results.²⁴

Finally, we want to emphasise the relevance of GPNs and RPNs as being quite pervasive in many of the cells of the matrix that relate country characteristics and instruments of industrial policy. Thus, the role of international linkages is quite apparent in all the columns representing policy areas of AIP (i.e. technology policy, human capital, finance, industry/competition, infrastructure). What is important to notice is also that relationships towards the principal 'agents' of international linkages, i.e. internationally operating firms, is being tailored towards the circumstances of the country or region (i.e. high/low technological level; geographic location etc.) Thus, policy authorities can become increasingly assertive and pro-active as a country/region develops its own innovation and human capital base, policy-making capacity etc. The emphasis can also shift from a more localised focus on building up supportive infrastructure towards emphasising domestic multi-hub approaches to regional development with an increased involvement of the domestic enterprise sector, exploiting increased bargaining power in relations with MNCs as regards moving upstream towards more demanding (skill- and technology-intensive) stages in international value chains. We shall return to the discussion of the role of GPNs and RPNs specifically in the European context in the next section of the paper.

6. 'APPROPRIATE INDUSTRIAL POLICY' (AIP) IN THE EUROPEAN CONTEXT

In this section we want to point to specific features that make the situation of European 'potentially catching-up countries' (PCUs) somewhat special and thus AIP in the EU and in its neighbourhood has to be tailored to these specific conditions.

As mentioned earlier, the European economy – thanks to the development of initially the European Communities (EC) and then the EU and the EMU – is an historical experiment of cross-country integration that has not (yet?) been emulated with anything like the same intensity anywhere else in the world. This has implications for the scope and nature of AIP that can be applied in the European context.

We shall move through each of the differentiating characteristics of PCUs already discussed in section 5 to point to the specificities of the European context:

Level of technological development: on the one hand, the possibilities for technology transfer, cross-country collaboration regarding technology development and in educational infrastructure and exchanges, are higher in the European Union and associated countries than in any other group of

²⁴ See also the exciting new project in this area: <https://www.soas.ac.uk/news/newsitem114119.html>

sovereign economies in the world. The Commission continually comes up with initiatives in this regard.²⁵ There are, however, also dangers connected with ‘deep integration’ for PCUs that could result from this increased scope for technology collaboration, researchers’ mobility etc. in the European space. There is the phenomenon of ‘winner takes all’, technology collaboration mostly concentrated amongst the already most advanced, and concentration of educational and ‘skill hubs’ in the most advanced economies and regions to the detriment of peripheral regions in the European economic and social space. A criticism that one can make of the concept of ‘industrial policy’ propagated in recent European Commission documents (see EC, 2010, 2012, 2014, 2017) is, firstly, that industrial policy is almost exclusively associated with innovation policy (and, to some extent, with environmental/ecological concerns) and, secondly, that it is also directed mostly towards the countries that are at or close to the global technology frontier. Hence it does not sufficiently take into account the potentialities and needs of countries and regions at lower or intermediate levels of technological capabilities.²⁶

Size of economies: In some sense, one can say that all PCUs in Europe are relatively small economies and, furthermore, ‘size’ of economies does not matter much anymore when barriers across markets have been brought down in many ways. However, firstly, policy-making bodies (both at national and regional levels) are still very much anchored in the histories and constitutions of the individual member countries even though there are also such bodies operating at the EU and European levels. Secondly, we can still see substantial features of market segmentation within the EU, but especially in countries (e.g. the Western Balkans) closely associated with the EU economy. Such segmentation refers to entry barriers for companies into each other’s markets, but also missing or underdeveloped transport connections, and also unwillingness of governmental authorities to cooperate cross-border (see e.g. Gabrisch et al., 2016). An ‘industrial policy’ addressing all these aspects of overcoming market segmentation that would thereby facilitate the exploitation of the potentialities of cross-country industrial development should thus be seen as forming an important part of Wider European industrial strategy.

Geographic factors: One can say that ‘geography’ (like ‘size’ above) plays much less of a role in Europe than in many other international contexts. Firstly, Europe is a densely populated continent with a large mass of high purchasing-power people living on it. Hence PCUs have the advantage of a continent in which there exists a big high-income market and distances (and thus transport costs) are small. East Asian economies also built their post-WWII development strategies on selling to high-income markets but distances were far larger. Furthermore, to all intents and purposes, Europe is a free trade zone even for countries outside the EU with some exceptions (such as certain limitations in agriculture, utilities, etc.). Hence, even countries outside the current EU that have accession, pre-accession, neighbourhood or partnership agreements face relatively liberalised access to EU markets to an extent that has no parallel in the world. Furthermore, transport infrastructure is high-quality in EU’s core area, but there are still quite large differences in the density of rail network connections, high-speed trains, highways etc.

²⁵ The European Commission’s attempts to foster the transfer of technology dates back to the late 1980s, easily discernible in the name of one of the key innovation programmes of the time, the *Strategic Programme for Innovation and Technology Transfer* Programme (SPRINT). Technology transfer also features prominently in the current *Competitiveness and Innovation Framework* Programme (CIP) and its specific programmes such as the *Entrepreneurship and Innovation* Programme (EIP). See: http://ec.europa.eu/cip/eip/index_en.htm. See also the Smart Specialisation strategies (e.g. Foray, 2013) rolled out throughout European regions which are intended to assist in particular backward regions in building up and broadening their knowledge base.

²⁶ See in this respect the targeting of ‘technological breakthrough’ areas (such as robotics, artificial intelligence, bio-economy, etc.) that dominate the EC documents’ formulation of industrial policy, with little or no regard for the possibilities of countries and regions at lower or intermediate levels of technological capabilities.

between peripheral countries and EU's advanced core countries (see e.g. Gabrisch et al., 2016). It is right that the Commission (together with EIB) has made major efforts to execute cross-border transport and communications infrastructure policies.

Raw material and environmental endowments: The issue of a 'raw material curse' is less of an issue in Europe (with the exception of Russia and some other CIS economies); however, there are still incidences of undue over-specialisation in certain material-intensive activities (such as the metals industry in Ukraine) and a lack of industrial diversification. Furthermore, there are phenomena analogous to some form of 'Dutch disease'²⁷ in relation to other phenomena that concern PCUs in Europe: one is the importance of tourism in some LMIEs in Europe (e.g. Croatia and Greece, but potentially also in other Balkan economies), the other is remittances. Both these factors can and do exert significant upward pressures on the real exchange rates of these countries and hence make (other) tradable sectors uncompetitive, thus leading to long-run 'structural external imbalances'. Taxation and incentives to utilise receipts from remittances and from tourism to support investment into tradable sector activities could counter-balance such pressures.

Institutional quality: Here again, one should emphasise the extraordinary situation in Europe where the transmission of institutional experience and legal structures has been of unprecedented speed across economies that might have had an authoritarian and non-market economy past (think of the Southern EU economies, on the one hand, and the ex-Communist countries, on the other hand). However, the experience is that formal transmission of legal codes and of institutional arrangements does not necessarily imply effective translation into actual behavioural patterns as we have witnessed in quite a few countries. Nonetheless, institutional and legal convergence is an important characteristic and an asset of the 'deep European integration' process that includes not only countries within the EU but extends to countries involved in pre-accession and DCFTA²⁸ processes and is also vital for countries and regions to be able to fully participate in the benefits of cross-border production and market integration. However, we would also here advocate careful adaptation of institutional and policy-making structures (e.g. in the fields of competition policy, technical standards, etc.) to the developmental requirements of countries and regions differentiated by their developmental levels. The EU's thinking and actions have been quite rigid in this respect.

Industrial policy and RPNs and GPNs: Finally, we want to return to the specific issue of the relevance of regional and global production networks (RPNs and GPNs respectively), particularly in the European context, to potentially support a catching-up process of LMIEs. The emphasis here is on 'potentially' as the integration into RPNs or GPNs does not automatically guarantee a successful catching-up process. The experiences of the Central-Eastern European economies (CEE-5; see section 4) but also of some of

²⁷ The notion of 'Dutch Disease' has been developed to characterise a situation in which the sudden detection of new raw material stocks (such as the exploration of North Sea oil fields in the late 1970s) leads to a strong upward pressure on a country's real exchange rate, thereby making other segments of the economy's tradable sector less competitive. The underlying mechanism is that the detection of such fields implies a 'wealth effect', thus higher expected real incomes and higher real rates of return on capital investment and ensuing capital inflows into the country. The notion of 'Dutch disease' referred to here covers other aspects that might lead to an upward pressure on the real exchange rate. Prominent examples are the increased spending power from a significant influx of tourists that pushes up domestic price (and wage) levels, and also the inflow of remittances from emigrants working abroad that increases again the purchasing power within the country without a commensurate expansion of domestic supply capacities.

²⁸ Deep and Comprehensive Free Trade Agreements (DCFTAs) have been signed with a number of EU Neighbourhood countries – Ukraine, Moldova, Georgia, Armenia – and are currently being implemented (see e.g. Adarov and Havlik, 2017).

the East Asian economies show that FDI-guided linkages with global production networks can have a very positive impact – and might even be essential – for industrialisation (and, in the case of CEE countries, reindustrialisation) of economies and also for the further ‘upgrading’ of industrial capabilities.

On the other hand, RPNs and GPNs can also have downsides. Firstly, they can – and most likely do – reinforce agglomeration of industrial activity not only in particular regions within a country (in CEE countries in the regions close to the Western borders) but also across the wider economic space (as we demonstrated with the distinct establishment of a ‘Central European Manufacturing Core’ (CEMC)). Secondly, integration into RPNs and GPNs can cement hierarchical structures of international specialisation, thus keeping regions and countries producing ‘low value added’ components in an internationally organised ‘value chain’ (VC).

Hence, from an industrial policy point of view, it is important that alongside an open policy vis-à-vis foreign investment, a parallel programme of industrial and regional policy is being implemented. With respect to the danger of ‘too extreme’ (from a social choice point of view) agglomeration tendencies one can counteract these with a ‘multi-hub’ strategy, i.e. developing a multiple of agglomeration nodes across regional space with attention given to providing good infrastructure, educational and training facilities, and encouraging clusters of bottom-up generated entrepreneurial and R&D collaboration. Particularly in Central and Eastern Europe, the very strong agglomeration tendencies of FDI-driven cross-border production networks in regions bordering the more advanced Western European economies and in the capital cities have led to very high regional disparities that resulted in a drain of skilled labour and problematic demographic developments in peripheral regions.

The other issue connected with RPNs and GPNs from the point of view of PCUs is to make sure that industrial (including RTD and educational and training) policies are continuously directed to facilitate the upgrading of a country’s or region’s position in international value chains. The issue here is not only to support such an upgrading process amongst the firms directly involved in RPNs and GPNs already set up, but also to encourage spin-offs from existing international production networks (IPNs), the emergence of domestic start-ups and of a swarm of domestic supplier firms, and encourage technology spillovers towards domestic enterprises.

The overall conclusion with regard to RPNs and GPNs thus is to take measures to avoid undue regional ‘over-agglomeration’ by pursuing a ‘multi-hub’ approach that involves IPN integration across a wider regional space. Secondly, to continue to use a range of policies (infrastructure, training and education, innovation, institutional quality) to continuously support an upgrading process of countries’ and regions’ positioning in international value chains. Thirdly, to exploit bargaining space with foreign investors to encourage spillover effects to the domestic enterprise sector and the regional economy.

CONCLUSIONS

This paper has discussed the specific challenges facing low- and medium-income economies (LMIEs) generally and those in Europe in particular in the current global context. This context is characterised by a more intensive phase of regional and global production integration than has been the case any time in history. The paper starts off with reviewing the main features of global developments: the increasing role that a sub-set of significant emerging economies play in the global economy, their success taking place

in the context of strong falls in transport and logistics costs as well as of major moves towards international trade liberalisation over the past decades. Furthermore, an important feature of international integration has been the increased role of internationally operating companies organising production networks ('global value chains') internationally.

While past processes of catching up were driven to an important degree by national development strategies (Germany, US, Japan in the late 19th century; then again Japan, followed by South Korea and other East Asian economies in the second half of the 20th century), we observe in the latest historical phase of successful catching-up processes an essential role of linking up with international production networks. This goes along with making use of the dramatically increased ease of international knowledge flows (through the activities of MNCs and the international mobility of students, researchers, professionals and managers) and the build-up of domestic capabilities.

Industrial policy has had to adjust to these new conditions. In the past, the emphasis was on targeting an industrialisation process as a sequence of supporting 'vertically integrated' industries (textiles, shipbuilding, steel, cars, electrical goods, etc.) that depended on the build-up of domestic technological know-how, of skills and infrastructure. This supported a gradual process of 'climbing up the ladder' in terms of moving towards technologically more sophisticated industries. The emphasis nowadays has shifted (more than before) to being successful receptors of internationally generated knowledge regarding product and process development (relevant for particular 'tasks' or 'production stages') and attracting the main 'agents' of diffusion of such knowledge, i.e. internationally operating companies. Very often the initial impetus is to provide 'enclaves' in the form of 'export-processing zones' (EPZs) in which MNCs can transfer their organisational structures along with their international linkages to other production sites and markets. What is provided by the local state is good infrastructure, an ability to draw on the most mobile and skilled part of the domestic labour force and provide legal and institutional conditions in these enclaves that are conducive to attracting foreign investors. Over time, of course, a successful strategy in such a context implies to make sure that the achieved linkages to international production networks (IPNs) and the technology transfer exert important spillover effects unto domestic companies, either in the form of widening the supplier network or the build-up of domestic export-oriented firms that can themselves link up with IPNs. All along, the emphasis is to not stand still with regard to a country's/region's positioning in vertically differentiated IPNs but to continuously work on 'moving up the ladder' in 'global value chains' (GVCs). Domestic industrial policy has an important role to play in this.

What are now the special conditions in Europe in this 'new age' of IPN-driven processes of catching up?

First of all, one has to be aware that catching-up processes are always prone to be vulnerable to 'external imbalances' that could stop a growth trajectory and lead to economic and social crisis. This was true in the past, as development processes were very often associated with 'balance-of-payments constrained growth' (see e.g. Thirlwall, 2011) and remains true, and even more so, under the specific conditions of the European economy. The European economy, within the EU but also beyond, is characterised by 'deep integration' of goods, capital and labour markets. Given the strong financial markets integration, potentially catching-up economies (PCUs) are prone to surges in capital inflows and outflows that can lead to real exchange rate misalignments, loss of competitiveness of the tradable sector and – at times – distorted economic structures with an over-proportionate build-up of the non-tradable sector. We have shown that amongst European LMIEs there is a bifurcation between some

countries (the CEE-5) that built up a potent tradable sector and other countries that experienced unsustainable private sector debt build-up, asset price bubbles in the non-tradable sector and suffered from insufficient export capacities that ended up in 'structural external imbalances'. Hence, in particular in the European context, a strong emphasis on restrictions (or incentive-based redirection) of capital flows away from an over-blown non-tradable sector and measures to support the tradable sector would be appropriate.

The other issue is the tendency of IPNs to generate strong regional agglomeration processes. IPNs, especially in the form of regional production networks (RPNs), attempt to minimise transport and logistic costs and also reap the benefits of agglomeration economies. Hence we witness in many LMIEs in which IPNs get established a strong regional concentration in areas where transport costs are low (regions bordering the more advanced Western European countries in the CEE-5; coastal regions in China etc.). Such agglomeration can be furthered through public infrastructural investments and location supports, but policy-makers can also attempt to pursue a 'multi-polar' (or 'multi-hub') strategy so that other regions can also benefit from (re-)industrialisation processes. One has to keep in mind that agglomeration processes are cumulative and, just as 'network externalities' can be reaped in one location, this can also lead to severe drainage of skilled personnel and purchasing power from other regions and thus lead to a cumulative process of 'peripherisation' of those regions, giving rise to widening regional disparities. A 'multi-hub' industrial strategy can counteract such tendencies and still reap agglomeration economies.

Thirdly, as mentioned above, plugging into RPNs or GPNs is not an end in itself: in order to pursue a sustained catching-up process, the positioning of a country or region in international value chains should continuously be acted upon through the use of a battery of support policies: most prominently would be the sustained build-up of a strong human capital base and adjusting training and educational structures to the changing requirements of skilled labour demands. Advanced economies have the advantage of a long history in building up complex 'innovation systems' that provide a tested research base, financing possibilities and institutional coordination mechanisms that bring entrepreneurship and public authorities together. It is not easy for LMIEs to set up competitive innovation systems and they often suffer from behavioural and institutional deficiencies. Hence we observe sustained hierarchical structures in innovation capabilities across the European continent and technology developments keep being driven by selected centres of excellence. There is scope here at the pan-European level, to develop a policy more sensitive to differentiated developmental starting points and institutional capabilities than has been evident so far so as to support a 'multi-hub' approach supporting a successful diffusion and dispersion process of innovation activity across the European continent.

In all the above areas, there are great benefits from European integration itself: a multi-hub approach can be supported through transport and logistics networks planned and executed at European and national levels. Human capital development can benefit from the high accessibility of apprentices, students, researchers to educational and training facilities across the European continent. And there is scope for a dynamic 'multi-hub' approach in the development of innovation systems across the European continent to avoid the rigidities of a sustained vertical structure of centres of excellence. There is scope for providing 'infant industry' support to new entrants also in this area. European policy initiatives in most of these areas could benefit from being guided by more developmental considerations and emphasising less a 'same size fits all' approach. An important issue to be resolved is to find the right balance between the execution of a Europe/EU-wide competition policy and giving sufficient leeway to

PCU countries and regions to use industrial policy instruments according to their differentiated developmental needs.

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