

WORKING PAPER

Chinese Trade and Investment in the Visegrad Countries: Mapping Increased Exposure and Volatility

Martin Šebeňa

Kiadó: Kína-KKE Intézet Nonprofit Kft.

Szerkesztésért felelős személy: Chen Xin

Kiadásért felelős személy: Huang Ping



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Abstract

A Central European manufacturing nexus has emerged in the past three decades, encompassing Germany, Austria and the four Visegrád countries. In this regard, a scrutiny of trade statistics based on value-added methodology indicates a significant increase in exposure of V4 countries towards China. Assessment of financial linkages shows a higher volatility potential of Chinese investments. Since the Chinese driven 16+1 and Belt and Road Initiatives strive for an increase in trade and investment flows between China and the region, both exposure and volatility are poised to grow further. However, economic interdependence within the manufacturing cluster decreases the efficacy of domestic policy actions aiming at reducing volatility. In order to mitigate potential macroeconomic volatility, V4 countries must pursue closer macroeconomic cooperation within the region, particularly with Germany.

Keywords: *China, Czechia, Hungary, Poland, Slovakia, global value chain, macroeconomic volatility*

Introduction

In their assessment of economic relationships between China and individual countries, both politicians and analysts often use bilateral trade figures and the amount of foreign direct investments (FDI) as the basis for their policy analyses. However, in a world of highly integrated supply chains, where intermediary products often cross multiple borders before being finalized, gross bilateral trade and FDI data may provide an inaccurate picture of the economic relationship, therefore leading to erroneous policy prescriptions.

It is the aim of this article to critically reassess the economic relationships of four countries – Poland, Czechia, Hungary, and Slovakia (commonly known as the Visegrád Four, or V4) – with China by applying the concept of Global Value Chains. The results of this analysis will be contrasted with the more commonly used bilateral trade data. Secondly, the investment structure of Chinese companies in the V4 countries will be examined by focusing on their level of integration into the manufacturing supply chain and their volatility potential. Thirdly, implications of the reassessment of the economic relationship will be presented, with the focus on discrepancies between current policies and the outcomes of the analysis. Finally,

the impact of the supply chain integration and volatility potential of Chinese investment on domestic policy actions will be discussed.

Methodology

Global and regional trade has accelerated since 1990 and its increase considerably surpassed global GDP growth. The rapid expansion of trade was mainly driven by two factors: trade liberalization and vertical specialization. Trade liberalization resulted in the decrease in tariffs and other trade barriers - most notably, the elimination of impediments for internal movement of goods and services within the European Union (EU), accompanied by the enlargement of the EU. Vertical specialization - often referred to as “fragmentation of production”¹- resulted in the increase of international trade in intermediate inputs. In 2012, OECD estimated that more than half of global imports of manufactured goods are intermediate goods and more than 70 percent of global imports of services are intermediate services (OECD, 2012). UNCTAD’s 2013 report estimated that 80 percent of global trade is linked to the production network of international companies (UNCTAD, 2013)

In Europe, German firms were at the forefront of vertical specialization. As Hans-Werner Sinn argued, geographical proximity, cultural similarities, and relatively high differential in labour costs (mainly due to excessive wage growth in Germany) have led many German firms to move parts of their production facilities into central and eastern European (CEE) countries (Sinn, 2006). The magnitude of this process has changed the structural relationship between the German and V4 economies to such a degree that the International Monetary Fund identified a “German-Central European Supply Chain Cluster” (IMF, 2013) and Roman Stöllinger’s team from The Vienna Institute of International Studies called it the “central European manufacturing core” (Stehrer & Stöllinger, 2013). Richard Baldwin called the region simply “Factory Europe” (Baldwin, 2012)

High integration of regional supply chains resulted in a steep increase of bilateral trade due to a surge in the trade of intermediate products used in manufacturing. This has created challenges for interpreting official trade statistics as these are generally measured in gross terms, which include both final and intermediate goods. Within cross border supply chains, intermediate goods are imported and re-exported after some processing. This results in inflation of export figures and inaccurate reporting of domestic value added, which is the most important driver of domestic employment and economic growth (Breda, Cappariello, & Zizza, 2008; Hummels et al., 2001)

A decomposition of gross exports into domestic value added and foreign value added should therefore reveal the amount of foreign intermediate products used in the manufacturing output of V4 countries as well as the amount of V4 value added in foreign, mostly German exports of final products. The focus of this paper is on tracking the amount of V4 value added in German exports of final products to China. Germany is one of the few countries in the world that runs a trade surplus with China due to a high amount of exports. The assumption we work with in this paper is that a part of German exports to China contains value added

¹ There is an extensive terminology describing this phenomenon. This paper uses the term “vertical specialization”, as used in a pioneering work by Hummels et al. (Hummels, Ishii, & Yi, 2001).

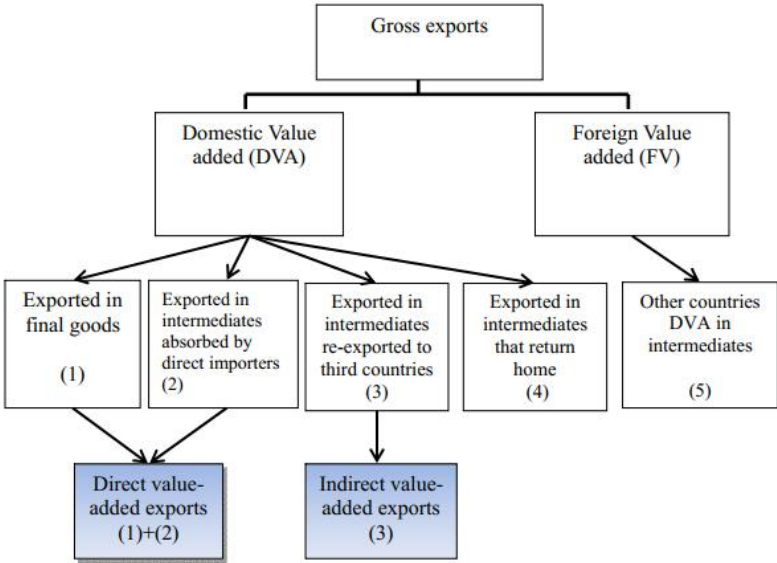
generated in V4 countries. This leads to two conclusions. Firstly, the manufacturing exposure of V4 countries to China is much higher than bilateral trade statistics suggest. Secondly, V4 countries' sensitivity to economic developments in China is higher than indicated by bilateral trade statistics.

Decomposition of Gross Exports

Case studies of global value chains have provided detailed examples of the discrepancy between gross and value-added trade. The most commonly cited study of the Apple iPod found that only \$4 out the \$144 price of Chinese factory assembled iPod constitutes the Chinese value added (Dedrick, Kraemer, & Linden, 2010). Subsequent studies refined the methodology and computed value added mostly within Asian supply chains (Koopman, Wang, & Wei, 2008; Wang, Powers, & Wei, 2009).

In the most comprehensive model developed by Koopman et al. (Koopman, Powers, Wang, & Wei, 2011), gross exports are decomposed into five categories depending on the location of value added and stage of production. These are (1) domestic value added (DVA) in final goods, (2) DVA in intermediate goods not processed for export, (3) DVA in intermediate goods processed for exports, (4) DVA exported to another country that returns back to the original country, and (5) foreign value added (FVA) used as input into exports.

Figure 1: Decomposition of Gross Exports into Value Added Exports

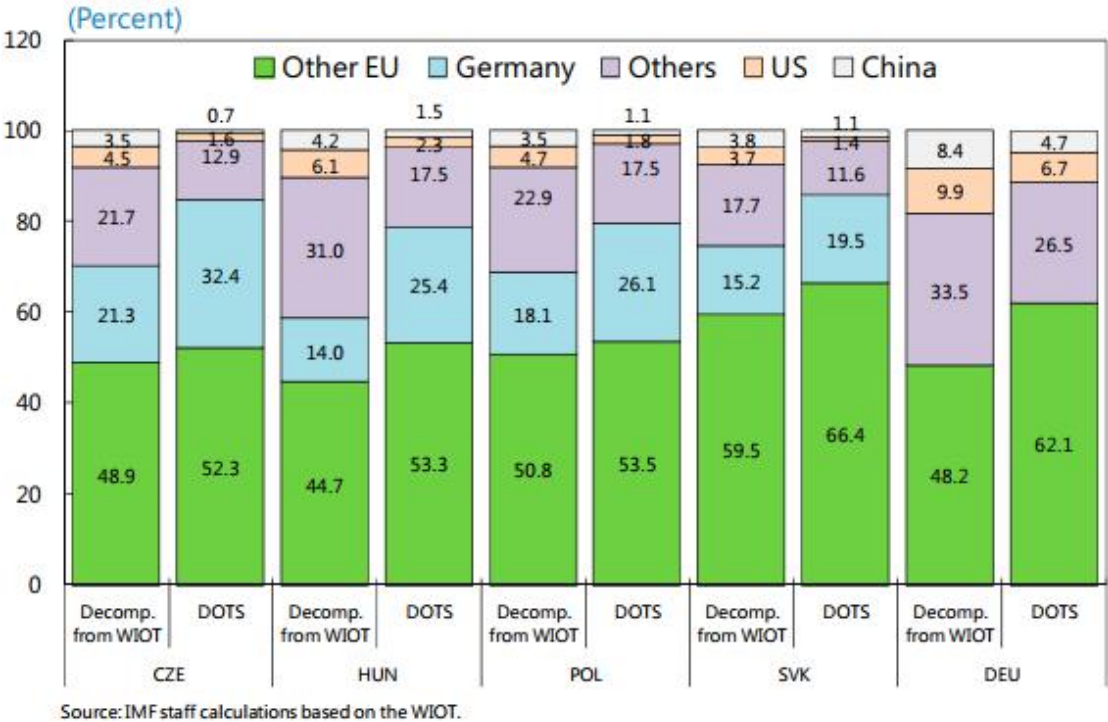


Source: Koopman et al., 2011

The third category is of particular importance as it allows us to revisit the export exposure of V4 countries to other trading partners based on final demand rather than proximate demand. More specifically, it allows us to establish the value added of intermediate products that are exported from V4 countries into Germany and then re-exported as final products to China. The decomposition of the goods exports conducted by the IMF staff based

on the World Input-Output Database (Timmer, Dietzenbacher, Los, Stehrer, & Vries, 2015) used the methodology developed by Koopman et al. and built on the previous IMF analysis conducted by Rahman and Zhao (Rahman & Zhao, 2013). The results show that actual exposure of V4 countries to China is approximately three times higher than indicated by the Direction of Trade Statistics (DOTS) database (IMF, 2013).² The exposure of Germany is almost double that reported by DOTS, as many of Germany’s intra-EU exports are intermediate products that are further processed in downstream facilities in other EU countries, including the V4.

Figure 2: Actual Exposure of the CE4 Countries Based on the Recipients’ Final Demand, 2009



Source: IMF, 2013

Table 1: Exposure of Selected Countries’ Goods Exports to China

	Czechia	Hungary	Poland	Slovakia	Germany
WIOT					
Value Added Decomposition	3.5%	4.2%	3.5%	3.8%	8.4%
DOTS					
Gross Exports	0.7%	1.5%	1.1%	1.1%	4.7%

Source: IMF, 2013

There are some significant implications of this analysis for the V4 countries. Firstly, it shows that the more commonly used gross trade data do not provide an accurate picture. The

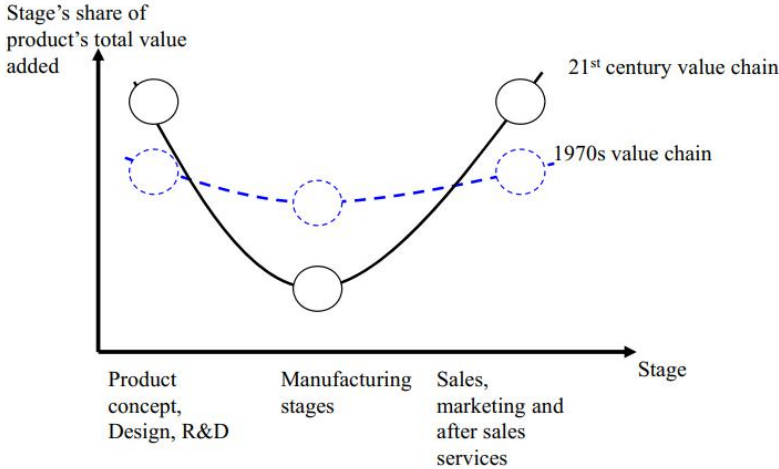
²Direction of Trade Statistics (DOTS), a database on imports and exports maintained by IMF, does not contain data identical with national accounts as it only considers trade in merchandise goods. National accounts include both goods and services.

gross trade statistics are prone to double counting: an imported intermediate input is used in manufacturing and re-exported, thus its value appears in both import and export data. Apart from data inflation, these statistics do not tell much about the final demand of the goods partially produced in the V4 countries as they do not distinguish between proximate and final demand. Therefore, economic policy based on such data, such as active promotion of imports into or exports from certain countries, may be incorrectly conceived.

Secondly, the integration into global supply chains has increased the exposure of V4 countries to the rest of the world. This implies that the efficacy of domestic policies aimed at stabilizing or stimulating economic activity may have weakened. The discussion of implications on these results on Sino-V4 relations will be provided after the analysis of the impact of global supply chain on FDI.

Additionally, Koopman’s methodology reveals the structure of participation in global value chains. Vertical integration has been enabled by “unbundling” and subsequently offshoring stages of production (Baldwin, 2012). Baldwin noted that value added tends to shift away from the offshored part of production, creating a “smile curve.” Value added is higher at the two ends of the curve, which require more knowledge input. Fabrication, especially final assembly, involves less value creation.

Figure 3: The Smile Curve



Source: Baldwin, 2012

Koopman’s methodology is also useful in measuring the scope of backward and forward integration. Backward integration is the linkage to the earlier stages of production, while forward integration signifies the connection to the later stages of production. A country’s FVA in trade (category 5 on Figure 1) is an indicator for a country’s backward integration, as it measures the amount of FVA in a country’s gross exports. To measure forward integration, the amount of domestic value added in foreign exports is assessed (category 3 on Figure 1).

The analysis of Stöllinger et al. (Stehrer & Stöllinger, 2013) indicates that production integration in the V4 countries is characterized by relatively stronger backward integration

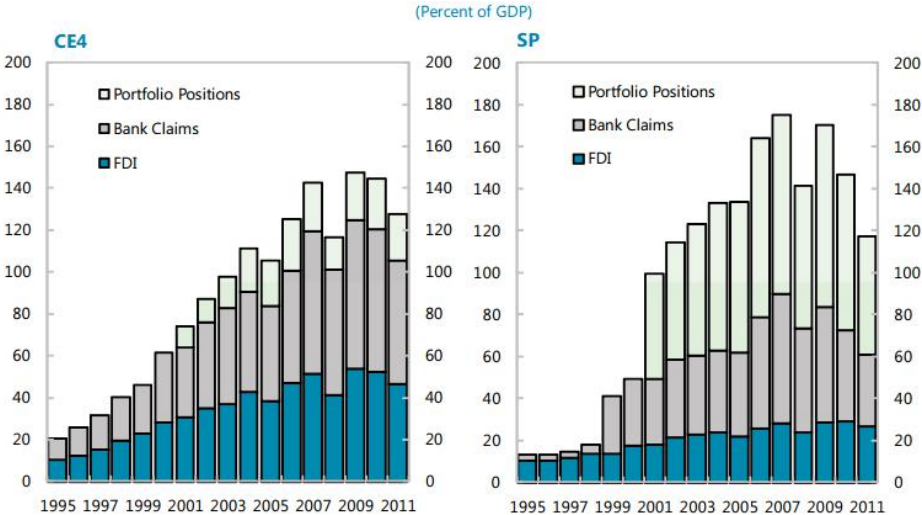
than forward integration. This suggests that the role of the V4 countries within the central European manufacturing core is that of assembly. Conversely, Germany and Austria exhibit relatively stronger forward integration, which suggests they are primarily suppliers of specialized inputs, i.e. act as technology providers. Analysis by the IMF also revealed that the share of domestic value added in all V4 countries decreased as vertical integration deepened, which is in line with Stöllinger et al (IMF, 2013).³

Decomposition of Financial Linkages

The evolution of an interdependent manufacturing core in central Europe is also evidenced by the structure of financial linkages in the region. A 2013 report by the IMF’s European research team has contrasted the financial flows into V4 countries with those into countries on the EU’s southern periphery (SP: Spain, Italy, Portugal, and Spain). The analysis distinguished between foreign direct investments (FDI), banking investments, and portfolio investments in financial assets.

The results show that the dominant form of capital inflows in V4 were FDI, while portfolio investments prevailed in southern Europe. FDI stock positions as a percentage of GDP in the V4 countries are approximately twice as large as in the SP (Figure 3). A further decomposition of FDI stocks into greenfield and mergers and acquisitions (M&A) revealed that the share of greenfield FDI is substantially higher than in the SP (Figure 4)

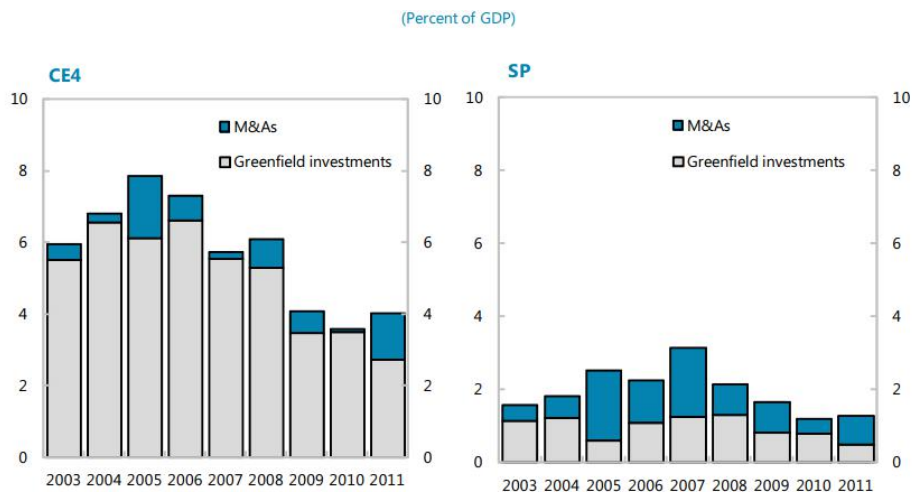
Figure 3: FDI, Bank Claims and Portfolio Positions



Source: IMF, 2013

³ However, the analysis by the IMF found evidence of technology transfer and indicated that the V4 countries slowly move up the curve towards more value added.

Figure 4: Breakdown of FDI into greenfield and M&A



Source: IMF, 2013

Firstly, the fact that the amount of FDI in V4 is higher than in the southern periphery supports the development of a deeply integrated manufacturing supply chain. FDI signifies direct ownership of predominantly manufacturing facilities, while other investment types are mainly into financial assets. Secondly, the substantially higher proportion of greenfield investment should be seen as a positive factor for the V4 countries, as greenfield investments are associated with an expansion in productive capacity and therefore growth. Moreover, greenfield investments are a more stable source of funding as they are less prone to sudden reversals in the form of capital flight. M&A agreements react much faster to global downturns relative to greenfield projects that usually require long-term planning and commitment (UNDP, 2011). This was evidenced during the eurozone crisis in 2010s, when large amounts of foreign capital abruptly exited southern European countries.

Implications for China – V4 relations

The decomposition of gross exports demonstrates that gross statistics are not a useful tool for assessing bilateral trade relations. This is especially true for open economies that are a part of a larger, multinational manufacturing nexus, which is the case of the V4 countries. Such data overstates the relationships within the geographical area and downplays the importance of final demand from countries outside the cluster. The analysis has also revealed that the V4 countries are approximately three times as exposed to final demand from, and the performance of, the Chinese economy than conventional statistical data indicates⁴.

⁴ It is important to note that the last available data in the econometric analysis was for 2011. While new data sets are available, an updated analysis has not been carried out. Due to the increase in trade between Germany and China, it is reasonable to expect a further increase of exposure of V4 countries to China.

However, the vast majority of analyses covering China – V4 relations rely on gross exports data.⁵ This is true for both Chinese scholars (Chen, 2012; Kong, 2014) as well as for V4 based researchers (Frank, 2013; Kříž, 2013; Matura, 2017; Toporowski & Gradziuk, 2013). Since these analyses often lead to policy outcomes, they need to be adjusted in order to paint a more accurate picture of the trade relationship and avoid ineffective policy outcomes.⁶

The existing literature on the effect of global value chains on the trade relationships between China and V4 reveals that China is partially engaged in the central European supply chain (Ando & Kimura, 2013; Andrea Éltető & Szunomár, 2015; A Éltető & Toporowski, 2013). Mitsuyo Ando and Fukunari Kimura point out that Chinese imports in machinery goods, mainly parts and components, have recorded a steep growth and are a sign of an expanded production network. Imports of parts and components in the transportation equipment sector – most closely related to the central European manufacturing core – have also risen, though not as dramatically as in the machinery sector.

This development also explains the structural imbalance of bilateral trade deficits that V4 countries run with China: they import intermediate goods from China that are used in the production chain, yet do not export intermediate goods into China. A European Commission sponsored study ascertained that 76% of value added in Chinese exports is sourced domestically⁷ (Gasiorek & Lopez-Gonzalez, 2013). While Chinese exports do contain about 5% of value added sourced from Europe, these are mostly technologically more advanced products that are procured from firms on the left or right-hand side of Baldwin's smile curve. As discussed previously, these goods rarely come from the V4 countries.

The analysis of global value chains indicates that V4 are poised to continue running bilateral trade deficits with China due to the structure of their economies. This has several policy implications.

Firstly, politicians in V4 should not attempt to actively pursue short term policies that aim to “close the gap”. Among such policies are direct export support for domestic producers and lobbying with the Chinese government. Direct export support for exporters into China may create undue advantage for such companies. Lobbying with the Chinese government can score short term gains, however in the mid to long term they will be unable to counter the underlying economic structure.

Secondly, the only way the trade deficits can change is by achieving structural change in either V4 or the Chinese economy. Moving up the value chain would enable V4 countries to export more technologically advanced products. If, on the other hand, China moves up the value chain, it can outsource some of its manufacturing into the V4 countries, just as Japan and South Korea have done.

⁵ This metric enjoys a prominent position despite the fact that occasionally policymakers admit it is inaccurate. Yi Gang, the governor of People's Bank of China, recently rejected the use of gross exports data in understanding the Sino-American trade relationship by stating: "In 2015, U.S. exports to China were about \$165 billion. In the same year, sales of U.S. companies' subsidiaries in China totaled \$222 billion. If we put them together, we will see a dramatic decline of the overall imbalance." (Qing, Kan, & Qi, 2018)

⁶ The V4 countries are not identical in their economic structure. The Polish economy is less dependent on the manufacturing nexus than the other three countries. However, economic activity related to the manufacturing supply chain still accounts for more than half of the country's GDP.

⁷ Thus, the iPod study cited above is not representative of the Chinese economy as a whole.

Thirdly, outsized focus on trade deficit can lead to disillusionment. Short term policies aimed at adjusting the imbalance will eventually fail, which may cause frustration. A point in case might be a temporary disengagement of the former Slovak prime minister Robert Fico from the China-led 16+1 initiative partially as a result of the realization that the Slovak trade deficit with China is not going to improve (Sme, 2014).

Fourthly, it should be pointed out that due to higher exposure of V4 countries to China through German re-exports of intermediary products made in V4, a relatively high level of dependency already exists. Companies based in V4 are thus sensitive to Chinese demand and policy-makers in these four countries should carefully observe the performance of the Chinese economy as well as developments in Sino-German relations.

Chinese Investment in V4

In the first decade of the 21st century, the majority of Chinese investments in the region arrived in the form of greenfield investments. As the Rhodium Group Report findings show, in the period 2000 – 2011 the number of greenfield investments significantly outnumbers M&As in each country, with

Table 2: Chinese Investment in V4 until 2011

Country	Greenfield Investments	Mergers and Acquisitions
Czechia	10	1
Hungary	14	4
Poland	15	1
Slovakia	0	0

Source: Hanemann & Rosen, 2012

the exception of Slovakia, where no Chinese FDI are recorded (Hanemann & Rosen, 2012). Analysts concluded that the reason for this preference for greenfield investments was the Chinese investors’ desire to tap into the EU market in manufacturing sectors with important consumer demand. These often involved sectors where the EU had anti-dumping measures in place against China (Jacoby, 2014).

However, this trend has reversed after 2010. In Czechia, China Energy Company Limited (CEFC) has the lion’s share of Chinese FDI to the country. All of CEFC’s investments came in the form of M&A (Furst, 2017). Its investments of 362 million EUR in 2016 are larger than all Chinese investment in the Czech Republic up to that date (220 million EUR). While Hungary is the largest recipient of Chinese FDI among the V4, 75% of the total value is attributed to a single transaction: the acquisition of chemical company BorsodChem by the Chinese Wanhua Group (Matura, 2017). Thus, a vast majority of Chinese FDI came as M&A. As Justyna Szczudlik reported, the Polish case is very similar to that of Hungary, as two large takeovers by Chinese companies in 2016 almost tripled the total stock of Chinese FDI in the country (Szczudlik, 2017). Thus, again, M&A is the predominant for of Chinese financial transfers into Poland. The Chinese investment in Slovakia was more evenly distributed among the various types of investment methods as Slovakia still awaits a major

Chinese investment. Total Chinese FDI stock in the country amounted to paltry 50 million EUR in 2017 (Pleschova, 2017).

The trend in V4 countries mirrors the trend of Chinese investment in the whole EU. This also began with a majority of greenfield investments and changed in the early 2010s. Until now, the vast majority of Chinese FDI in the EU came in the form of M&As. However, Thilo Hanemann and Mikko Huotari noticed that in the past year the dominant form of investment has become portfolio investments, where the acquirer purchases less than 10% of the target company (Hanemann & Huotari, 2018). This trend has not reached the V4 countries yet.

Curiously, the switch of preference from greenfield investments to M&A coincided with the launch of the China-driven initiative towards central and eastern European countries, known as 16+1. In the wake of the European financial crisis in the early 2010s, China engaged post-Communist countries that were eager to receive investment in order to spur the growth of their economies. Chinese diplomatic outreach was accompanied by heightened economic engagement, mostly in the form of Chinese investment and participation in infrastructure projects in the CEE countries. It is beyond the scope of this paper to establish whether the 16+1 initiative contributed to the shift in investment preferences, however, it should not be ruled out.

With regards to the German-Central European supply chain, while Chinese companies did buy into the production network by purchasing a number of firms integrated within the cluster - such as automotive suppliers - the primary driver of such purchases has been the transfer of technology and managerial techniques (Hanemann & Huotari, 2015). However, as indicated in the methodology section, the V4 countries are mostly in the assembly part of the supply chain (backward integration prevails) and they host a relatively small number of firms that can be a suitable target for technology motivated M&A.

The analysis of Chinese FDI to V4 from a supply chain angle leads to a number of observations. Firstly, a relatively small amount of large M&A investments have skewed the composition of Chinese FDI into the V4 countries. However, due to the structure of the V4 economies, such projects will be infrequent and irregular. On the other hand, the amount and size of greenfield investment exhibited a stable growth.

Secondly, in connection to the first point, governments should focus more on greenfield investments as this is where actual growth of the economy comes from. Moreover, greenfield investments traditionally have a better reputation with domestic publics. It has been greenfield projects that have driven the economic growth in the post-Communist transformation period.

Thirdly, M&As can be a source of macroeconomic volatility and potential instability (Hanemann & Huotari, 2015). While the amount of Chinese M&As in the region is too low to have a significant impact, the 16+1 initiative, in concert with the overarching Belt and Road Initiative, lists a number of sizable potential investment projects in the pipeline (Vangeli, 2017). If they materialize, a large investment in a relatively small economy can increase the volatility potential practically overnight. As an example, the potential 1.4 billion EUR acquisition of U.S. Steel Slovakia by a Chinese conglomerate HeSteel Group could have such an impact (Turecsányi & Kironská, 2017). Chinese investments in the global mining and materials sectors have already created “boom and bust” cycles in countries with a high

concentration of Chinese investments, hence the possibility of investment induced volatility in a small and open economy should not be understated (Hanemann & Huotari, 2015).

Fourthly, while other Asian countries are entering the central European manufacturing cluster predominantly in the form of greenfield investment, Chinese companies choose M&A as their preferred investment option (Andrea Éltető & Szunomár, 2015). This suggests a shorter investment horizon, with primary focus on the acquisition of technology and management skills and a lower chance of the increase of production facilities. A shorter investment horizon further increases the volatility potential of an investment.

Conclusion

The analysis of trade and investment links between the V4 countries reveals increased exposure of V4 countries towards China as well as a relatively higher volatility potential of Chinese investment in the region. The central European manufacturing nexus facilitated the increase of economic interdependencies between smaller central and eastern European countries and non-EU countries. Moreover, the preferred way of Chinese investors' engagement with the European supply chain is via M&As, which is a less stable and more volatile form of investment than greenfield investments. As both trade and investment flows gradually increase, exposure and volatility are poised to grow further as a result.

The position of Germany is crucial in the economic relations between China and V4. Germany has been a strong facilitator in the creation of indirect trade links between China and V4 since its China-bound exports contain intermediate products manufactured in V4. Therefore, the development of Sino-German relations should be of great interest to the V4 countries. A trade dispute between the largest European and Asian economies could have damaging impacts down the manufacturing supply chain.

The IMF study found that Germany has been a provider of macroeconomic stability in the region and sheltered the region from the destabilizing impacts of both intra-EU as well as global economic turbulence (IMF, 2013). Its economic performance, trade excellence and its government's macroeconomic prudence all contributed to its stabilizing power. Moreover, a large developed country is more resilient towards sudden changes in investment flows.

While increased investment and trade flows come with numerous economic benefits, deep embeddedness and structural dependency on a manufacturing cluster also increase the overall exposure of the V4 countries to non-EU countries, and to China in particular. An increase in exposure in turn decreases the efficacy of domestic policy actions that aim at reducing volatility and stimulating economic growth. Since the 16+1 and Belt and Road Initiatives aspire to increase both trade and investment flows between V4 and China, European countries need to pursue a closer macroeconomic coordination within the manufacturing nexus – and with Germany in particular - in order to more efficiently mitigate and counter potential macroeconomic risks.

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About the author

Martin Šebeňa, PhD Candidate in European Studies, The University of Hong Kong