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Working Paper 160

JANUARY 2019

How Do Technical Barriers to Trade Affect Foreign Direct Investment?

Evidence from Central, East and Southeast Europe

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The author wishes to thank Gábor Hunya, Ron Davies, Vasily Astrov, Sándor Richter and Michael Pfaffermayr who provided constructive and comprehensive comments during the preparation process of this paper. Thanks should also go to the participants of the European Trade Study Group (ETSG) 2018 in Warsaw and the 11th FIW Research Conference on International Economics in Vienna.

Abstract

Trade liberalisation and the EU enlargement in the past two decades allowed European multinational enterprises (MNEs) to benefit from production fragmentation in Central, East and Southeast Europe (CESEE). Recent studies show that market regulations and standards that are embedded within Technical Barriers to Trade (TBTs) might not necessarily hamper trade but improve the quality of products, production procedures, and market efficiencies. However, complying with the regulations embedded in the TBTs imposed by a host country might be costly enough to discourage MNEs from investing there. Furthermore, MNEs from countries that impose more regulations and standards might be more capable of investing abroad. This article analyses how TBTs imposed by both home and host countries affect inward FDI stocks in the CESEE countries during the period 1996-2016. The results suggest that Specific Trade Concerns (STCs) raised on trade-restrictive TBTs imposed by CESEE countries induce 'tariff jumping' motives of investment to these countries, while regular TBTs as indications of positive externalities and efficiency gains at home discourage outward FDI. Besides, FDI stocks by non-EU28 countries are found to be stimulated by regular quality TBTs imposed by the host economies.

Keywords: CESEE, FDI, MNE, quality NTM, TBT, TBT STC, regulations and standards, tariff jumping

JEL classification: F13, F14, F21, F23

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1. Introduction

One important factor discouraging firms to undertake foreign direct investment (FDI) is overregulation in a given market. In fact, regulation havens have proved to be suitable host countries for FDI. In 2017, 126 national investment policy measures were implemented in 65 economies, out of which 16% imposed restrictive regulations indicating a more critical stance against FDI (UNCTAD, 2018). Discrimination against foreign ownership (Koyama and Gloub, 2006; Zhang and van den Blucke, 2014; UNCTAD, 2018), environmental regulations (Dasgupta et al., 2001; Cole and Elliott, 2005; Cole et al., 2006; Dijkstraet et al., 2011; Millimet and Roy, 2015), labour regulations (Kucera, 2002; Javorcik and Spatareanu, 2005; Dewit et al., 2009; Dellis et al., 2017; Davies and Vadlamannati, 2013), and taxing regulations (Görg, 2002; Jones and Temouri, 2016; Kottaridi et al., 2019) have been studied as impediments to FDI flows, while little attention has been paid to product and trade regulations embedded within qualitative non-tariff measures (NTMs).

Many classical studies have found high trade costs to be an important factor encouraging Multinational Enterprises (MNEs) to undertake horizontal foreign direct investment (HFDI). In HFDI, firms establish all production procedures in the host country to supply the final product. This allows them to completely shift the trade costs of the final product from their home country to the destination market.

However, in recent decades great efforts have been made to reduce trade frictions and trade costs. Currently, very low or no tariffs at all are levied on the import of many products, especially those exported to the developed economies. This trade liberalisation has allowed MNEs to benefit from production fragmentation across the globe by undertaking vertical foreign direct investment (VFDI). In fact, due to lower trade costs MNEs establish some parts of their production activities in other countries where the costs of factors of production are relatively smaller. The recent large manufacturing investment in assembly lines in Central, East and Southeast Europe (CESEE) is one important manifestation of this phenomenon.

Given the generally low import tariffs, international trade today is to a large extent impeded by NTMs (Niu et al., 2018), which also cover regulatory measures concerning health, safety, environmental quality, and general standards. According to the Multi-Agency Support Team (MAST)[1] classification, 'NTMs are policy measures other than ordinary customs tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both'. Classifications of NTMs are mostly based on international regulations mandated by the WTO and other organisations, while scholars have additionally classified NTMs based on their nature and implications into two broad categories.

According to the MAST classification, one important category of NTMs aims at qualitative characteristics of products and production procedures. Technical Barriers to Trade (TBTs) are one of the most important examples in the 'quality NTM' category. TBTs allow countries to impose restrictions on the imports of low-quality products suspected to harm the domestic consumers' health, the global

[1] http://unctad.org/en/Pages/DITC/Trade-Analysis/Non-Tariff-Measures/MAST-Group-on-NTMs.aspx

environment, safety, etc. Such trade policy tools aim at maintaining specific standards and regulations in the import market. For instance, in 2010 the Albanian Council of Ministers amended a regulation aiming at the protection of the environment[2] to stop imports of substances that deplete the ozone layer; the importer should resort to the substitution or recycling of those substances. This indicates that due to this regulation the production of these substances is also prohibited in Albania. As another example, in 2009 the Cabinet of Ministers of Ukraine approved a technical regulation on the labelling of domestic use lamps and defined requirements for imports of these products[3] in relation to the efficiency of electric power use and as to the conformity assessment. As yet another example, in 2017 the Czech Republic amended a draft act related to the prohibition of bacteriological (biological) and toxin weapons from 2002 as a national security requirement on the imports of organic chemicals (HS 29) and arms and ammunition (HS 93). Bao and Qiu (2012) find that TBTs notified to the WTO have a positive impact on the intensive margins of exporting. Improving the market efficiency by information requirements such as mandatory labelling, setting standards for the intermediate inputs of production to meet the technical requirements in the next stages of production, or banning products for safety and security reasons are such quality-related aspects behind TBTs.

Where the market fails to address these quality issues in an optimal way, governments are obliged to set up regulative frameworks to enhance the level of standards (Swinnen, 2016; Ing and Cadot, 2017). If the import product does not comply with these regulations, access to the market is halted and the exporter might bear the costs of conformity. Alternatively, a producer who intends to serve the host market might opt for establishing a production facility in the host market which applies the local standards embedded within TBTs, rather than restructuring its production line at home at an extensive sunk cost to comply with conformity assessments of only a specific market. This outcome is very similar to 'tariff jumping' motives behind HFDI, although the mechanism works through trade-restrictive regulative measures which effectively play a role in transforming the final product or the production procedure to a new set of standards.

WTO members are eligible to impose TBTs unilaterally in line with the TBT agreement of the WTO. Some TBTs might be too trade restrictive, raising concerns of other WTO members, which ultimately might cause trade disputes. WTO members are obliged to notify their unilateral (non-discriminative) NTMs directly to the WTO Secretariat to improve the transparency in trade policies, but they can also discuss issues related to other members' policies and notify them to the meetings of the TBT Committee. WTO members can actually raise Specific Trade Concerns (STCs) on TBTs imposed by other countries that they feel are too restrictive or discriminative, no matter whether or not those TBTs are notified to the WTO directly by the imposing member. These TBT STCs are usually treated differently from regular TBTs. While TBTs might even enhance trade by improving the market efficiencies, TBT STCs might unnecessarily hamper trade due to protectionist motives (Orefice, 2017; Herghelegiu, 2018; Ghodsi, 2018). After discussions in WTO Committee meetings, and after finding mutual solutions, these STCs might be even resolved. Therefore, exporters facing these protectionist measures might decide to move their production lines to the host country to possibly satisfy the protectionist motives behind the measures, for example by increasing the employment in the host market after the investment is realised. In other words, trade protectionism of these policy measures could induce 'tariff jumping' motives of FDI.

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2 WTO source reference: G/TBT/N/ALB/39

3 WTO source reference: G/TBT/N/UKR/19, G/TBT/N/UKR/19/Suppl.1

In contrast to the 'tariff jumping' motives, stringency of regulations in an economy might discourage companies to make investments. Restrictive quality regulations embedded in regular TBTs could be good indicators of stringent regulations in the imposing country. Other types of regulations such as taxation policies and labour standards in a country are other determinants of FDI that usually stimulate inward FDIs when they are relaxed rather than stringent. The pollution haven hypothesis (PHH) (Selden and Song, 1994; Eskeland and Harrison, 2003) argues that a country that is regulated below the stringency level of other countries' environmental regulations has a comparative advantage in pollution-intensive industries. Regulations embedded within TBTs could also discourage MNEs from investing in an economy. In analogy to the literature covering other types of regulations, MNEs prefer to find locations in which they can operate with the lowest stringency of regulations evading the costs of compliance.

Therefore, taking the trade impact of TBTs into account, TBTs as trade policy measures represent standards with technological content and stringent regulations that might be impediments to investment. In contrast, as the literature on NTMs and trade indicates, TBTs might improve market efficiencies, which might translate into lower supply costs due to better access to markets and final consumers. Therefore, when a TBT restricts or completely prohibits exports of a product, the exporter would establish its own production facilities in the destination market only if the stringent regulation in the host country is not costlier than complying with it through the home production line and exporting the modified product. However, if the regulations and standards are technologically impossible to comply with by exporters, the latter will not only stop their exports but also avoid investing in the destination market imposing those regulations and standards. Thus, as an important hypothesis this paper investigates whether regular TBTs encourage or discourage FDI.

Both FDI and trade are bilateral relationships between two countries, therefore, while analysing FDI, the other direction of trade flows and its related costs should be taken into consideration as well. VFDI usually increases when trade costs are lower in both directions. This means that trade-restrictive policies imposed by the home country on the product imported from the host country potentially reduce VFDI. This should hold only in an integrated production process where the ultimate goods are produced at home using intermediate inputs imported from the invested production lines in the host economy. A smart trade policy aligning itself with the domestic industry would usually avoid harming the profit of such domestic firms investing abroad in upstream sectors by imposing the restrictive trade measures on their own imports of intermediate products from the host economy back to home, which are either used as their intermediate inputs of production or sold as final product in their retail stores to the final domestic consumer. Besides, when stringency of regulations at home becomes too much of an obstacle that increases the long-run variable costs of production, the MNE would increase its investment in a host country with lower stringency of regulations and standards.

This article will analyse how TBTs influence the inward stocks of FDI in CESEE countries from all countries in the world during the period 1996-2016. Two types of TBTs will be used in the analysis: one is regular TBTs as an indicator of stringency of regulations in an economy that is imposed unilaterally (non-discriminatory), and the other is TBT STCs as an indicator of trade restrictions that are notified bilaterally (discriminatory).

The hypothesis will be tested whether MNEs respond to TBT STCs as they do as 'tariff jumping' when they invest more in a host economy with more protectionist TBT STCs. The second hypothesis to be

tested will be whether investors are discouraged by regular TBTs as an indicator of stringency of regulations and standards in the host country and they also invest away from the home economy with more imposed TBTs as an indicator of overregulation, or investors are motivated by these regular TBTs as they improve market efficiencies benefiting production.

Last but not least, after the collapse of the Soviet Union and in the past two decades CESEE countries[4] have liberalised their trade and economies in particular with regard to Western Europe (the Old EU). These countries with the exception of Turkey share a common history of a centralised economy but their speed of capital and trade liberalisation has been different. Large investments have flown from the advanced economies to benefit from the non-utilised capacities in the CESEE countries. More recently, manufacturing production such as the automotive industry has become scattered and fragmented across Europe and related products cross different borders along the supply chains to finally reach the end consumer. Some CESEE countries have become members of the European Union (EU) through a gradual process of trade liberalisation and convergence in the level of standards and regulations to the old Member States. Goods are freely traded across the borders of EU members. NTMs across the EU do not hamper trade due to the harmonisation of standards and regulations, and their mutual recognition. Mutual recognition means that, while a single member can implement its own standards and regulations, the trade of products between Member States cannot be affected by these, although the regulations could affect extra-EU imports to the Member State imposing them. Therefore, having non-EU CESEE countries as control groups the accession process of EU-CEE countries will be better analysed. Furthermore, the above-mentioned hypotheses of the research will be analysed in a robustness test controlling for harmonisation and mutual recognition of TBTs across the EU, and by separating the samples of estimations between EU and non-EU countries. Using econometric techniques and gravity modelling, this article will contribute to the literature by analysing how TBTs imposed by home and host countries could affect FDI stocks. The structure of the rest of the paper is organised as follows: section 2 provides a brief literature review; section 3 discusses the econometric methodology and the data; section 4 presents the empirical results; and finally section 5 concludes.

[4] The CESEE countries included in the analysis comprise Albania, Bulgaria, Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Moldova, Macedonia, Poland, Romania, Russia, Slovakia, Slovenia, Turkey, and Ukraine. Belarus, Bosnia and Herzegovina, Kosovo, Kazakhstan, Montenegro, Serbia are excluded from the analysis because they were not part of the WTO until 2016 and no data on their TBT notifications to the WTO were available for them.

2. Literature review

The literature on FDI has developed over several decades. Dunning (1977, 1981) first established the OLI (ownership-location-internalisation) conceptual framework. In his settings, John Dunning explains that firms make decisions to invest abroad when their market power would increase by *ownership* of products or production process, when the *location* of their operation abroad increases their benefits, and when the externalities associated with their own undertaking activities abroad are *internalised* by themselves rather than possibly wasted through arm's length agreements.

The OLI framework was then developed into a more formalised and theoretical framework that James R. Markusen (2002) calls 'knowledge-capital model'. This strand of the literature (Markusen, 1984, 1997; Ethier, 1986; Helpman, 1984, 1985, 2006; Markusen and Venables, 1998, 2000; Carr, Markusen and Maskus, 2001; Melitz et al., 2004) links the decision to invest abroad to the firm characteristic of being productive enough to be internationalised. The main point of all these studies and theoretical frameworks is that internationalised firms and more specifically MNEs make substantial use of capital knowledge. Capital knowledge can be related to intangible assets, reputation, brand names, ownership of licences and patents, marketing strategies, scientific and technical employment, R&D activities, product differentiation and innovation, etc. While such assets could be situated in one location such as the home country or where their costs are the lowest, their productivity could spread to several locations. Knowledge diffusion to other parts of the production process in other locations has advantages due to economies of scale at the firm level. It is important to note that regulations and standards on products, issued either publicly or privately, usually convey the technologies and know-how that are generated by such innovative firms.

While the literature mentioned above focused mainly on theoretical frameworks of FDI and localisation strategies, another strand of literature studied how regulations play a role in FDI patterns and dynamics. However, little attention has been paid to the impact of product regulations on FDI, while the impact of other regulative measures has been widely studied. For instance, the FDI Regulatory Restrictiveness Index (RRI) calculated by the Organisation for Economic Co-operation and Development (OECD) measures how discriminative countries are regarding inward FDI in comparison to their own domestic investment (Koyama and Gloub, 2006). According to the most recent study by UNCTAD (2018), concerns about national security and foreign ownership of land and natural resources have become important motives behind new regulations in some countries restricting FDI. This report also recommends governments to implement coherent policies in line with international investment policies avoiding overregulation.

The Pollution Haven Hypothesis (PHH) is one of the most relevant concepts in this strand of literature: it suggests that environmental regulations move production locations to poor countries with a less stringent level of regulations. Grossman and Krueger (1991) claim that development and environmental quality follow an inverted U-curve. Selden and Song (1994) provided seminal evidence that pollution increases in lien with the level of income; then, gradually, by addressing the environmental qualities via regulations, new technologies reduce the level of pollution. As the development of such new

technologies needs large investments, firms might opt for choosing a location with lax environmental regulations that require lower investment costs than what is needed to develop the new technology at home (Eskeland and Harrison, 2003).

In this context, Cole and Elliott (2005) argue that although Northern countries are very restrictive with respect to environmental regulative qualities, capital-intensive sectors from the North that are pollution-intensive cannot be easily invested in countries of the South as the latter are labour abundant and do not offer enough capital infrastructure. They test these opposing forces between the PHH and the capital-labour hypothesis (CLH) empirically on two pollution haven countries, Mexico and Brazil, and finally show that the US invested more in capital-intensive sectors that are also more pollution-intensive. Controlling for the endogeneity of environmental regulations and geographical spillovers, Millimet and Roy (2015) find empirical evidence that states with more stringent environmental regulations across the US attract less FDI.

Stringency of labour regulations and standards has also been considered as an impediment to FDI. In contrast to this conventional wisdom, Kucera (2002) finds that FDI is larger where workers' rights are stronger. However, a firm-level study by Javorcik and Spatareanu (2005) indicates that when labour market regulations in the host economy were more flexible in absolute terms or relative to the home country, FDI flows were larger across nineteen Western and Eastern European countries during 1998-2001. Using bilateral FDI stocks across OECD countries in a semi-gravity framework, Dewit et al. (2009) also find that labour protection discourages FDI as an anchorage device; and the protection differentials between the two partner countries are also negatively linked to FDI. In a similar context, Davies and Vadlamannati (2013) present evidence that in order to provide an attractive environment for FDI, countries compete with each other in reducing labour rights.

Taxations and doing business regulations are other impediments to investment. For instance, Görg (2002) finds that US FDI in manufacturing in other countries is negatively affected by profit taxation and exit costs. In another study on 14,209 MNEs in twelve OECD countries, Jones and Temouri (2016) examine the determinants of tax haven FDI. Kottaridi et al. (2019) exploit institutional failures such as weak or incomplete regulations and high taxation in shaping FDI. Dellis et al. (2017) use the Fraser Economic Freedom Index, which is constructed using several indicators including product market regulations to analyse how advanced economies' economic structure influences FDI inflows, and they find a significant impact of the Freedom Index on FDI inflows. They also use the OECD product market regulation (Koske et al., 2015), which is covering issues related to market efficiencies and competition.

The determinants of bilateral FDI flows have been analysed in a gravity framework that was initially proposed by Tinbergen (1962) for studying bilateral trade flows and further developed by other scholars (see Anderson and Wincoop, 2003; Head and Mayer, 2014). Brenton and Di Mauro (1999) analysed the bilateral FDI outflows and exports from the EU countries of Germany, France, the United Kingdom and the US to 35 OECD and non-OECD countries during 1992-1995. Using the gravity approach they find that gravity modelling also works for FDI flows. Controlling for determining factors of FDI, their results suggest that FDI inflows to the advanced Central and Eastern European Countries (CEECs) in transition were higher than the expected potential of the predicted model. Frenkel et al. (2004) follow a similar methodology and examine bilateral FDI flows to 22 emerging economies; they find that flows are significantly affected by distance and both home and host characteristics such as GDP growth. Egger and Pfaffermayr (2004) find that during the 1990s the impact of different events in the EU integration

process on intra-EU FDI relations has been substantially positive but anticipatory. Bénassy-Quéré et al. (2007) use the gravity model to show that institutional quality in governance matters for attracting FDI to developing economies. In contrast, Kolstad and Wiig (2012) find that this does not hold for all investing countries and Chinese outward FDI goes to countries with poor institutions but with abundance of natural resources. Head and Ries (2008) use Poisson Maximum Likelihood as was proposed by Silva and Tenreyro (2006) for gravity models on trade flows to better account for zero values in the dependent variable and to have better point estimates robust in the presence of heteroscedasticity of the error term. Using Bayesian Model Averaging, Blonigen and Piger (2014) find little evidence on the impact on FDI flows of host country policy variables such as multilateral trade costs, business costs, infrastructure or political institutions in OECD countries, while bilateral agreements proved to effectively improve FDI patterns.

The literature has mostly studied the impact of NTMs on trade flows. For instance, Bora et al. (2002) offer different measurements of NTMs and their impact on aggregate trade flows. Bao and Qiu (2012) find that TBTs imposed by WTO members during 1995-2008 reduce the probability of exports (extensive margin) while they increase the export volumes (intensive margins). Blind (2001) and Blind and Jungmittag (2005) use patents and standards as proxies for innovative capacity increasing trade flows and competitiveness. Disdier and Fontagné (2010) explain how the legislation implemented by the European Union on genetically modified organisms (GMOs) reduces trade of food products to the EU. These trade regulations by the EU led to a trade dispute. In the end, the EU was condemned by the Dispute Settlement Body of the WTO ruling for remedies and compensation of the losses endured by the exporting countries.

Some other studies in the literature analyse the diverse impact of NTMs on trade flows at the product level. While Kee et al. (2009) limit the impact of NTMs to being only trade restrictive, more recent studies provide evidence that NTMs are also enhancing trade flows of some products (Beghin et al., 2015; Bratt, 2017; Ghodsi et al., 2016, 2017; Niu et al., 2018) due to positive externalities associated with higher standards and product qualities. Fontagné et al. (2015) show how restrictive sanitary and phytosanitary (SPS) measures on which STCs are raised negatively affect both intensive and extensive margins of exporting at the firm level. Navaretti et al. (2018) analyse how STCs raised on quality NTMs imposed by the EU affect productivity of firms across the EU.

There is still a lack of evidence on the decision of firms to undertake FDI in response to changes in quality NTMs, while the relation between quantitative NTMs (e.g. antidumping) and FDI has been more under the focus of economists (Belderbos et al., 2004). Campa et al. (1998) consider common US imports restrictions such as quotas, voluntary export restraints, non-automatic licensing, harmonisation standards, etc. as non-tariff barriers (NTBs). However, the only information they have is whether there exist such NTBs on a 4-digit SITC category of imports. Using data for 1988 they find that the FDI to imports ratio has a quadratic relation with NTBs, in which it increases in the first order; this positive relation gradually decreases by more NTBs. In a theoretical framework, Wand et al. (2011) argue that in the presence of quality differentiation, raising the domestic quality requirements on imported products induces the foreign investors offering higher quality to undertake FDI in the domestic market. Yet, there is no empirical evidence in the literature to confirm this argumentation.

Nevertheless, quality NTMs cannot be considered as traditional tariffs or NTBs to restrict trade flows only. Specifically technical NTMs such as TBTs embed standards and regulations which indicate the

level of technology and production know-how in a country. Furthermore, as other studies in the literature on FDI indicate, overregulation could be an important discouraging factor for FDI. While the literature on trade and TBTs suggests that regulations and standards improve market efficiencies and competitiveness through positive externalities, it is not clear how these regulations impact FDI stocks. Therefore, this article contributes to the literature by studying how regulations within TBTs affect FDI in CESEE. Similar to the recent development in gravity modelling of trade flows, this article extends the literature on FDI by analysing the bilateral impact of trade policy measures on bilateral FDI stocks by taking the multilateral resistances into consideration. This allows that the only impact on bilateral FDI of the bilateral trade policy embedding regulations would be the variation that is left between the two bilateral partners which moves over time.

3. Methodology and hypotheses

A firm's decision to undertake FDI has several determining factors depending on the type of FDI, i.e. either horizontal or vertical. When controlling for country-level time-variant variables such as common determinants of FDI like the size of the two economies, the focus is on the impact of bilateral TBTs on bilateral FDI stocks. The equation to be estimated is as follows:

$$FDI_{ijt+k} = e^{[\alpha_1 N_{ijt}+\alpha_2 T_{ijt}+\alpha_3 TBT_{ijt}+\alpha_4 TBTSTC_{ijt}+\alpha_5 T_{jit}+\alpha_6 TBT_{jit}+\alpha_7 TBTSTC_{jit}+\alpha_8 Z_{ijt}+\omega_{it}+\omega_{jt}+\omega_{ij}]}.\varepsilon_{ijt},\ k \in \{1,2\} \quad (1)$$

where FDI_{ijt+k} is the stocks of FDI in US dollar in host country i from home country j at time $t+k$, which is assumed to be a function of some determinants in the previous kth year. TBT_{ijt} is a measure on TBTs imposed (being in force or initiated) by country i on imports from country j at time t; $TBTSTC_{ijt}$ includes a measure on the STCs raised (notified to the WTO Committee) by country j on the TBTs imposed by country i in year t that are not resolved or withdrawn until that year. The data on these two measures do not overlap with each other. T_{ijt} is the simple average tariff in percentage points that is imposed by country i on imports from country j at time t. While a positive estimate of α_2 hints at HFDI, for VFDI trade costs of products shipped to the home country matter as well, therefore, the reciprocal trade policy measures are also included in the regression as TBT_{jit}, $TBTSTC_{jit}$, and T_{jit}. As discussed earlier, TBTs contain regulations and standards in an economy that might reduce imports of products that are not fulfilling their requirements. An increase in this variable indicates how stringent these trade policy measures and their embedded standards and regulations are in an economy. Similar to the pollution haven hypothesis, larger TBT_{ijt} discourages inward FDI to the host economy i and, therefore, α_3 is expected to be negative. However, according to the literature on the impact of quality NTMs on trade, a larger number of TBTs could improve market efficiency, positive externalities, and/or competitiveness of firms, which might be reflected in a positive coefficient α_3. Similar to the same logic, α_6 is expected to become either positive as more regulations at home might induce MNEs to undertake FDI abroad due to overregulation, or negative as better regulations at home discourage firm to invest abroad. However, for 'tariff jumping' motives, a trade protectionist T_{ijt} and $TBTSTC_{ijt}$ would encourage HFDI and discourage VFDI, therefore, the signs of their estimated coefficients would identify types of FDI.

TBTs are usually imposed at the disaggregated product level (e.g. at the 4- to 6-digit level of the Harmonised System, HS). In order to aggregate them to the (bilateral) country level, one can use the trade-weighted average number of TBTs across all products traded between two trading partners, which is referred to in the literature as the coverage ratio of NTMs (see Bora et al., 2002; Bao and Qiu, 2010, Nicita and Gourdon, 2013). Here, stocks of NTMs are used, weighted by trade values at the 6-digit level as follows:

$$N_{ijt} = \sum_h \frac{M_{ijht}}{\sum_h M_{ijht}} N_{ijht},\ \ \forall N \in \{TBT, TBTSTC\}$$
$$N_{jit} = \sum_h \frac{M_{jiht}}{\sum_h M_{jiht}} N_{jiht},\ \ \forall N \in \{TBT, TBTSTC\} \quad (2)$$

where M_{ijht} is the import value and N_{ijht} is the stocks of NTMs – i.e. the number of NTM in force accumulated – of product h to country i from country j in year t. These indicators have an advantage in comparison with general product regulations indices such as that of the OECD or the Fraser Economic Freedom Index mentioned before. The advantage is that using the export weights we know for sure that the home country is able to produce and export the product on which the TBTs are imposed by the host economy. However, when a TBT, particularly an STC, becomes too restrictive, trade value might fall to zero and the TBT will be excluded from the measures above. Moreover, trade and FDI might be co-determined making these variables endogenous in the estimations. In order to avoid these problems, as the benchmark specification, simple averages are used instead of trade-weighted averages of NTMs.

Furthermore, not all 6-digit products might be relevant for FDI. As discussed before, in the last decades, fragmentation of production processes in auto manufacturing across Europe has been marked as the major sector of FDI. In another specification, measures are constructed only using the NTMs imposed on manufacturing products. However, there might be a measurement bias in identifying the product HS codes under the focus of each notification, mainly because many WTO members do not notify NTMs with full information. In order to avoid such a measurement error, similar to Bao and Qiu (2012), the total number of NTM notifications to the WTO in each year by each country will be used in another robustness check.

Moreover, Z_{ijt} includes exports from the host economy to the home economy in logarithm $\ln(X_{ijt})$, and imports to the host economy from the home economy in logarithm $\ln(M_{ijt})$ as additional control variables. In order to control for the EU and WTO memberships, two variables are included indicating whether both partner countries are members of the EU and WTO. To reduce the general endogeneity bias due to dual causality and simultaneity bias, the dependent variable is forwarded for one and two periods in two separate specifications, respectively.

Since the bilateral impact of trade policy variables on bilateral FDI stocks is of the main interest here, this article follows the strand of the literature on gravity modelling controlling for multilateral resistances (Anderson and van Wincoop, 2003). Therefore, in order to control for country-level time-variant variables like GDP, country-time fixed effects are used. Therefore, host-time ω_{it}, and home-time ω_{jt} fixed effects are used in addition to country-pair fixed effects ω_{ij} controlling for any time-invariant relationship between the two countries such as distance, colonial relationship, language, and sharing borders. In this FDI model, with these fixed effects, the only correlating variation between the FDI stocks and trade policy measures would be what is left between i and j that moves over time.

As another important specification, the sample will be divided into two groups of EU28 and non-EU28 countries in both home and host economies of FDI. This will indicate how liberalisation of some CESEE countries to Western Europe and further their accession to the EU played a role in the impact of trade policy measures on FDI. It is important to note that products are freely traded in the EU single market and NTMs are either harmonised or mutually recognised across the EU. Therefore, NTMs and tariffs between EU members are set to zero.

Bilateral FDI stocks cover many zero values. In fact, 27% of the sample of estimations includes zero FDI stocks. Changing the FDI stocks to logarithms will eliminate 27% of the sample causing biased estimations. In order to have unbiased estimation results, the Poisson Pseudo-Maximum Likelihood (PPML) estimator is used following Head and Ries (2008). The PPML estimation procedure including

multidimensional fixed effects is run using the Stata package implemented by Larch et al. (2018). Standard errors are clustered by country-pairs that are robust against the heteroscedasticity in the error term that is caused by bilateral shocks.

3.1. DATA

The analysis is done over the inward stocks of FDI in seventeen CESEE countries during the period 1996-2016. The FDI data have been downloaded from the wiiw FDI Database[5] that collects data from national sources and Eurostat statistics covering inward FDI stocks in CESEE countries from all over the world. Data on NTM notifications are provided by the WTO Secretariat via the Integrated-Trade Intelligence Portal (I-TIP). The I-TIP database includes many notifications with missing codes at the 6-digit level of the HS classification, which is not suitable for econometric analysis. In a related research, Ghodsi et al. (2017) improved the database by imputing the respective HS codes. This improved database on TBTs and TBT STC notifications to the WTO is used. In I-TIP, bilateral TBT STCs are separated from unilateral TBTs and they do not overlap with each other. Nevertheless, two robustness checks are presented in the appendix in either of which TBTs or TBT STCs are excluded. Countries that have never been members of the WTO during the period of analysis are excluded.

Bilateral product-level trade data are collected from UN COMTRADE through the World Bank's World Integrated Trade Solution (WITS) software. Tariffs are compiled as ad valorem equivalents (AVEs) of simple average tariffs at HS 6-digit level estimated by the UNCTAD methodology. Data on tariffs, provided by the UNCTAD Trade Analysis Information System (TRAINS), are also collected through WITS. However, since there are some missing values, data from the WTO Integrated Data Base (IDB) are also collected to complement.

[5] https://data.wiiw.ac.at/foreign-direct-investment.html

4. Results

Table 1 and Table 2 respectively present the estimation results on the next period and second next period bilateral inward FDI stocks in 17 CESEE countries for the period 1996-2016. In all estimations, coefficients of tariffs imposed by the host economy are statistically significantly positive indicating 'tariff jumping' motives for HFDI. Tariffs imposed by the home country have also statistically significant coefficients that are negative. Therefore, higher costs of trade from host to home economy are related to lower stocks of FDI in the CESEE region. This suggests that when through HFDI the whole production process takes place in the host economy, it would be costly to import the final products from the host to the home economy when tariffs imposed by the home country are high. Therefore, with higher bilateral tariffs imposed by the home against the host economy, the lower motivation for undertaking outward FDI from home to host country reduces the stocks of FDI in the CESEE.

Table 1 / Estimation results on the next year inward FDI stocks in CESEE during 1996-2016

Dep. Var. FDI_{ijt+1}	M1	M2	M3	M4	M5	M6
T_{ijt}	0.018***	0.017***	0.018***	0.018***	0.018***	0.018***
	(0.0050)	(0.0050)	(0.0050)	(0.0050)	(0.0050)	(0.0051)
T_{jit}	-0.0056***	-0.0057***	-0.0064***	-0.0057***	-0.0064***	-0.0053***
	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)
$TBT\ STC_{ijt}$	1.48***	0.60	1.21***	1.34***	1.12***	0.31**
	(0.45)	(0.59)	(0.17)	(0.50)	(0.18)	(0.12)
$TBT\ STC_{jit}$	0.13	0.78	-0.24	0.31	-0.070	-0.010
	(0.35)	(0.59)	(0.20)	(0.38)	(0.20)	(0.044)
TBT_{ijt}	-0.0069	0.017	-0.0049	-0.015	-0.0076	0.0026
	(0.012)	(0.012)	(0.0057)	(0.014)	(0.0057)	(0.0032)
TBT_{jit}	-0.021***	-0.049***	-0.0045*	-0.025**	-0.0093***	-0.013***
	(0.0083)	(0.0092)	(0.0023)	(0.010)	(0.0034)	(0.0047)
$\ln(X_{ijt})$	-0.018	-0.017	-0.023	-0.013	-0.022	-0.016
	(0.016)	(0.017)	(0.017)	(0.016)	(0.017)	(0.017)
$\ln(M_{ijt})$	0.0080	0.014	0.029*	0.012	0.025	0.017
	(0.016)	(0.017)	(0.017)	(0.016)	(0.017)	(0.017)
WTO_{ijt}	-0.35**	-0.31*	-0.39**	-0.28	-0.39**	-0.43**
	(0.17)	(0.18)	(0.17)	(0.18)	(0.17)	(0.18)
EU_{ijt}	-0.16	-0.27**	-0.061	-0.24*	-0.12	-0.24***
	(0.12)	(0.12)	(0.097)	(0.12)	(0.097)	(0.081)
N. Obs.	12807	12807	12807	12807	12807	12807
R-squared	0.988	0.988	0.988	0.988	0.988	0.988
AIC	9.71557e+11	9.70616e+11	9.68688e+11	9.70477e+11	9.67708e+11	9.72757e+11
BIC	9.71557e+11	9.70616e+11	9.68688e+11	9.70477e+11	9.67708e+11	9.72757e+11
ω_{ij} **– Bilateral-FE**	Yes	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Host-time-FE**	Yes	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Home-time-FE**	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors clustered by host-home pairs in parentheses; * p<0.1, ** p<0.05, *** p<0.01.
Model M1 includes simple averages of stocks of NTMs on all non-zero trade flows; model M2 includes simple averages of stocks of NTMs on all products including zero-trade flows; model M3 includes import-weighted averages of stocks of NTMs on all positive trade flows; model M4 includes simple averages of stocks of NTMs on only manufacturing positive trade flows; model M5 includes import-weighted averages of stocks of NTMs on only manufacturing positive trade flows; and model M6 includes the number of NTM notifications notified to the WTO in each year.

In almost all models, TBT STCs imposed by the host economy are statistically significant and positive. This is also evident in the estimations excluding regular TBTs, results of which are presented in Table 4 in the appendix. This suggests that when an STC is raised by the home country on a trade-restrictive TBT imposed by the host, the FDI stocks in the host country increase. This result goes along with the theoretical framework presented by Wang et al. (2011) according to which raising the quality requirements of foreign products increases the probability of foreign firms to invest. Similar to the results on tariffs, this hints towards 'tariff jumping' motives of the FDI in response to these trade discriminatory measures. However, TBT STCs imposed by the home countries do not have any statistically significant impact on FDI in any of the models presented in Table 1, Table 2, and Table 4.

Table 2 / Estimation results on the next second year inward FDI stocks in CESEE during 1996-2016

Dep. Var. FDI_{ijt+2}	M1	M2	M3	M4	M5	M6
T_{ijt}	0.015***	0.015***	0.014***	0.016***	0.014***	0.015***
	(0.0044)	(0.0044)	(0.0045)	(0.0044)	(0.0045)	(0.0046)
T_{jit}	-0.0074***	-0.0071***	-0.0077***	-0.0075***	-0.0080***	-0.0068***
	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0019)
$TBT\ STC_{ijt}$	1.69***	1.37**	1.16***	1.43***	1.08***	-0.053
	(0.45)	(0.63)	(0.17)	(0.48)	(0.18)	(0.087)
$TBT\ STC_{jit}$	0.015	0.049	-0.088	0.20	0.076	-0.022
	(0.36)	(0.66)	(0.19)	(0.37)	(0.19)	(0.052)
TBT_{ijt}	0.0060	0.0048	-0.0051	-0.013	-0.0085	0.0043
	(0.013)	(0.012)	(0.0064)	(0.014)	(0.0066)	(0.0027)
TBT_{jit}	-0.044***	-0.044***	-0.0062**	-0.040***	-0.011***	-0.014***
	(0.0081)	(0.0088)	(0.0026)	(0.0085)	(0.0035)	(0.0043)
$\ln(X_{ijt})$	-0.014	-0.014	-0.019	-0.016	-0.021	-0.018
	(0.015)	(0.016)	(0.016)	(0.015)	(0.016)	(0.016)
$\ln(M_{ijt})$	0.028*	0.025	0.031*	0.026	0.033**	0.029*
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
WTO_{ijt}	-0.22	-0.28	-0.30*	-0.21	-0.32*	-0.37**
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)
EU_{ijt}	-0.17	-0.22**	-0.018	-0.26**	-0.087	-0.16**
	(0.11)	(0.11)	(0.091)	(0.11)	(0.091)	(0.074)
N. Obs.	12433	12433	12433	12433	12433	12433
R-squared	0.988	0.988	0.988	0.988	0.988	0.988
AIC	9.59332e+11	9.62074e+11	9.61492e+11	9.60263e+11	9.60050e+11	9.69012e+11
BIC	9.59332e+11	9.62074e+11	9.61492e+11	9.60263e+11	9.60050e+11	9.69012e+11
ω_{ij} **– Bilateral-FE**	Yes	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Host-time-FE**	Yes	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Home-time-FE**	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors clustered by host-home pairs in parentheses; * p<0.1, ** p<0.05, *** p<0.01
Model M1 includes simple averages of stocks of NTMs on all non-zero trade flows; model M2 includes simple averages of stocks of NTMs on all products including zero-trade flows; model M3 includes import-weighted averages of stocks of NTMs on all positive trade flows; model M4 includes simple averages of stocks of NTMs on only manufacturing positive trade flows; model M5 includes import-weighted averages of stocks of NTMs on only manufacturing positive trade flows; and model M6 includes the number of NTM notifications notified to the WTO in each year.

Regular TBTs imposed by the host economy do not have any statistically significant impact on FDI stocks. However, a higher number of regular TBTs imposed by the home country discourage MNEs from investing in the CESEE region. According to the literature on the impact of TBTs on trade flows (e.g. Beghin et al., 2015), TBTs might improve market efficiencies through positive externalities. Therefore, by implementing new regulations and standards that are embedded within TBTs, countries can discourage

outward FDI stocks. This is also evident in the estimations excluding TBT STCs that are presented in Table 5 in the appendix.

Exports from host to home country have negative but statistically insignificant coefficients in all models. However, imports from home to host economy are statistically significantly increasing FDI stocks in some models. Particularly this is more evident in all of the estimations excluding regular TBTs that are in Table 5 in the appendix. It is a common issue that FDI accompanies trade of capital goods from the home to the host economy, and unless controlling for regulations within TBTs such a relationship becomes even stronger.

According to the estimation results of many of the models, when both partner countries were WTO and EU members, the stocks of FDI were lower in the CESEE. This might suggest that liberalising trade after joining the WTO and even further after becoming members of the EU reduced the stocks of FDI across countries, a hint at substituting HFDI by trade.

4.1. EU VS NON-EU

Table 3 presents the results of estimations including NTM measures constructed using simple averages on all products (i.e. model M2 in Table 2) while separating the sample of countries into four categories according to EU membership. Two years forwarded FDI as dependent variable is chosen as the benchmark specification in these models. As one observes, results do not hold consistently across samples.

In the first column to the right of column M2, the sample covers all EU-CEE countries as host economies and EU28 as home economies of FDI. Higher tariffs imposed by the host economy that is accessing the EU in later years induce larger FDI stocks. Thus, during the accession period when tariffs are gradually reduced, the stocks of FDI in EU-CEE are decreasing. This indicates that most of the FDI was horizontal FDI which was motivated by 'tariff jumping'. However, tariffs imposed by the EU28 home economies do not statistically affect FDI stocks in EU-CEE. This does not indicate evidence for vertical FDI either. While TBT STCs imposed by the EU-CEE host economies are dropped from the estimations simply because no STC was raised by the EU members against TBT imposed by EU-CEE countries, larger TBT STCs imposed by the EU28 home economies increase the stocks of FDI in EU-CEE, which was not observed in the earlier results over the whole sample of CESEE. This shows that when imports to the EU are restricted by discriminatory TBT STCs, there are more motivations for investors to invest in CESEE. This is also in line with the negative coefficient of exports from EU-CEE host economies to EU28 home economies $\ln(X_{ijt})$, which is statistically significant at the 5% level. All these results hint at the dominance of HFDI in the EU-CEE by the EU28.

In the second column to the right of column M2, host economies are non-EU CESEE countries and home economies are EU28 countries. Negative coefficients of both tariffs indicate that FDI stocks between these economies are rather vertical FDI. Therefore, higher trade costs from both sides reduce the FDI stocks in non-EU CESEE countries. Similar to the results in model M2 and other models presented above, TBT STCs imposed by the host economy increases the FDI stocks. However, TBT STCs imposed by the EU28 become statistically significant and negative on this sample of estimations. Therefore, a higher number of restrictive TBT STCs imposed by the EU28 against non-EU CESEE

countries reduces the FDI stocks. According to these results, regular TBTs imposed by the EU do not have any statistically significant impact on FDI stocks in any CESEE country.

Table 3 / Estimation results on the next second year inward FDI stocks in CESEE during 1996-2016 – EU vs. non-EU

Dep. Var. FDI_{ijt+2}	M2	Host EU-CEE Home EU28	Host non-EU-CEE Home EU28	Host EU-CEE Home non-EU28	Host non-EU-CEE Home non-EU28
T_{ijt}	0.014***	0.026***	-0.044**	-0.047***	0.0024
	(0.0045)	(0.0073)	(0.019)	(0.010)	(0.0074)
T_{jit}	-0.0077***	0.0065	-0.025***	0.0039**	-0.014***
	(0.0019)	(0.0055)	(0.0089)	(0.0018)	(0.0041)
$TBT\ STC_{ijt}$	1.16***		3.03***	0.37*	-0.17
	(0.17)		(0.70)	(0.22)	(1.19)
$TBT\ STC_{jit}$	-0.088	6.79***	-96.6**	0.89***	-4.85
	(0.19)	(1.03)	(43.8)	(0.24)	(7.20)
TBT_{ijt}	-0.0051	0.075	0.042	0.026***	0.47***
	(0.0064)	(0.060)	(0.10)	(0.0058)	(0.14)
TBT_{jit}	-0.0062**	-0.0096	0.0046	-0.049***	-0.0045
	(0.0026)	(0.0070)	(0.0053)	(0.0089)	(0.017)
$\ln(X_{ijt})$	-0.019	-0.051**	-0.0054	0.17***	0.015
	(0.016)	(0.022)	(0.037)	(0.036)	(0.029)
$\ln(M_{ijt})$	0.031*	0.049	0.025	0.033	-0.035
	(0.017)	(0.033)	(0.054)	(0.032)	(0.028)
N. Obs.	12433	5335	2131	3662	1263
R-squared	0.988	0.984	0.997	0.967	0.964
AIC	9.61492e+11	3.65230e+11	1.48555e+11	1.26169e+11	5.56613e+10
BIC	9.61492e+11	3.65230e+11	1.48555e+11	1.26169e+11	5.56613e+10
ω_{ij} **– Bilateral-FE**	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Host-time-FE**	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Home-time-FE**	Yes	Yes	Yes	Yes	Yes

Robust standard errors clustered by host-home pairs in parentheses; * p<0.1, ** p<0.05, *** p<0.01
All models include simple averages of stocks of NTMs on all products including zero-trade flows.

In the second last column to the right, the estimation sample covers EU-CEE as host economies and non-EU28 countries as source countries of FDI. Tariffs imposed by host EU-CEE countries reduce stocks of FDI while tariffs imposed by non-EU28 home countries increase stocks of FDI in EU-CEE. This suggests that while the type of such FDI is vertical, the investment should be related to the final stages of production. The reason is that in order to integrate the production process in the EU-CEE, the MNE from non-EU28 country needs very low trade costs (i.e. tariffs here) to export its intermediate inputs/products to the host economy. However, higher tariffs imposed by the non-EU28 country – where the MNE is originally located – lead to higher FDI stocks in the host market, where the final products of the FDI might be sold without being shipped to the home country. In such an environment, TBT STCs imposed by the EU-CEE is now weakly significant, while the restrictive TBT STCs imposed by the home country again increase FDI stocks. Similar to the results on the whole sample presented above, regular TBTs imposed by the non-EU28 home country discourage MNEs from undertaking FDI and, therefore, FDI stocks in the EU-CEE decrease. Moreover, more TBTs imposed by the EU-CEE host increase the stocks of inward FDI, which is not observed in the sample including EU home countries.

In the last column to the right, the estimation sample covers only non-EU28 countries as host and home economies. Tariffs imposed by the host do not have statistically significant coefficient, which might indicate a mixture of horizontal and vertical FDI. However, tariffs imposed by the non-EU28 home

economies have a negative impact on the FDI stock in non-EU CESEE. This suggests that higher trade costs to the home economy reduce the integration of production networks, which leads to lower vertical FDI in the host economy. TBT STCs between non-EU28 countries do not have statistically significant coefficients. However, regular TBTs imposed by the host economy increase FDI stocks. This suggests that regular TBTs imposed by the host countries generally increase FDI originating from non-EU28 countries.

5. Summary and concluding remarks

In this article, the impact of technical barriers to trade (TBTs) on inward FDI stocks in Central, East and Southeast Europe (CESEE) is analysed. The econometric results suggest that tariffs and specific trade concerns (STCs) raised on restrictive TBTs imposed by the CESEE countries encourage multinational enterprises (MNEs) to undertake FDI in CESEE economies. Moreover, regular TBTs embedding standards and regulations imposed by the home country discourage outward FDI stocks in CESEE, a result that is in contrast to the pollution haven hypothesis (PHH) but is in line with the literature on the impact of quality NTMs improving market efficiencies, positive externalities, and competitiveness. These results are consistent across various specifications including different measures on regular TBTs and TBT STCs.

Separating the sample into four categories by the EU28 gives further insights. First, it is found that FDI from EU28 to EU-CEE during 1996-2016 was mostly horizontal FDI because tariff reduction during the accession period of EU-CEE countries to the EU is correlated with lower FDI stocks. Besides, restrictive TBT STCs imposed by the EU against EU-CEE countries before their EU accession were correlated with higher FDI stocks in EU-CEE.

Second, it is found that FDI by the EU28 in non-EU CESEE countries is dominantly of a vertical type. This is because higher tariffs from each direction are related to lower FDI. Third, it is found that FDI from a non-EU28 home country in an EU-CEE host economy is mostly of vertical integration, where the product is produced in its last stages of production in the EU-CEE and is then sold in the EU market rather than being exported back to the non-EU home country.

Fourth, it is found that TBT STCs imposed by the non-EU CESEE (EU-CEE) host countries increase their inward FDI stocks from EU28 (non-EU28) home countries. This indicates that the positive significant impact of these restrictive measures imposed by the host economies in the sample of all countries is mainly motivated by the non-homogeneous regulations. It is worth mentioning that during the EU accession process, regulations and standards of non-EU members gradually converges to those of the EU. This means that STCs imposed by the non-EU countries against the EU and those imposed by the EU against non-EU economies stimulate inward FDI to the imposing country due to the ‘tariff jumping’ motive.

Finally, it is found that the stocks of FDI in non-EU CESEE countries originating from non-EU28 are a mixture of vertical and horizontal types of FDI. Moreover, a higher number of regular TBTs in the host CESEE countries usually stimulate larger stocks of FDI from mainly non-EU28 countries. Therefore, when the regulations improve market efficiencies in CESEE, MNEs outside of the EU invest more in the CESEE countries.

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Appendix

Table 4 / Estimation results on the next second year inward FDI stocks in CESEE during 1996-2016 – excluding regular TBTs

Dep. Var. FDI_{ijt+2}	M1	M2	M3	M4	M5	M6
T_{ijt}	0.015***	0.015***	0.014***	0.015***	0.015***	0.015***
	(0.0046)	(0.0045)	(0.0045)	(0.0046)	(0.0045)	(0.0046)
T_{jit}	-0.0072***	-0.0068***	-0.0077***	-0.0072***	-0.0076***	-0.0068***
	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0019)
$TBT\ STC_{ijt}$	1.60***	1.60**	1.11***	1.63***	1.14***	-0.054
	(0.44)	(0.63)	(0.17)	(0.47)	(0.18)	(0.087)
$TBT\ STC_{jit}$	-0.32	-0.66	-0.22	-0.30	-0.19	-0.022
	(0.36)	(0.67)	(0.19)	(0.37)	(0.19)	(0.052)
$\ln(X_{ijt})$	-0.020	-0.017	-0.018	-0.019	-0.019	-0.015
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
$\ln(M_{ijt})$	0.033*	0.031*	0.036**	0.032*	0.035**	0.029*
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
WTO_{ijt}	-0.37**	-0.39**	-0.35**	-0.35**	-0.34**	-0.35**
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)
EU_{ijt}	0.040	0.014	0.050	0.028	0.043	-0.14*
	(0.090)	(0.093)	(0.079)	(0.089)	(0.077)	(0.072)
N. Obs.	12433	12433	12433	12433	12433	12433
R-squared	0.988	0.988	0.988	0.988	0.988	0.988
AIC	9.68937e+11	9.69831e+11	9.63807e+11	9.69181e+11	9.63939e+11	9.71633e+11
BIC	9.68937e+11	9.69831e+11	9.63807e+11	9.69181e+11	9.63939e+11	9.71633e+11
ω_{ij} **– Bilateral-FE**	Yes	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Host-time-FE**	Yes	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Home-time-FE**	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors clustered by host-home pairs in parentheses; * p<0.1, ** p<0.05, *** p<0.01
Model M1 includes simple averages of stocks of NTMs on all non-zero trade flows; model M2 includes simple averages of stocks of NTMs on all products including zero-trade flows; model M3 includes import-weighted averages of stocks of NTMs on all positive trade flows; model M4 includes simple averages of stocks of NTMs on only manufacturing positive trade flows; model M5 includes import-weighted averages of stocks of NTMs on only manufacturing positive trade flows; and model M6 includes the number of NTM notifications notified to the WTO in each year.

Table 5 / Estimation results on the next second year inward FDI stocks in CESEE during 1996-2016 – excluding TBT STCs

Dep. Var. FDI_{ijt+2}	M1	M2	M3	M4	M5	M6
T_{ijt}	0.015***	0.014***	0.015***	0.015***	0.015***	0.015***
	(0.0045)	(0.0045)	(0.0046)	(0.0045)	(0.0046)	(0.0046)
T_{jit}	-0.0071***	-0.0071***	-0.0069***	-0.0072***	-0.0073***	-0.0068***
	(0.0019)	(0.0019)	(0.0019)	(0.0020)	(0.0019)	(0.0019)
TBT_{ijt}	0.0052	0.0080	-0.0054	-0.013	-0.0081	0.0043
	(0.013)	(0.012)	(0.0066)	(0.014)	(0.0068)	(0.0027)
TBT_{jit}	-0.041***	-0.044***	-0.0046*	-0.038***	-0.011***	-0.014***
	(0.0084)	(0.0088)	(0.0025)	(0.0085)	(0.0033)	(0.0043)
$\ln(X_{ijt})$	-0.012	-0.012	-0.015	-0.013	-0.018	-0.017
	(0.015)	(0.016)	(0.016)	(0.015)	(0.016)	(0.016)
$\ln(M_{ijt})$	0.017	0.020	0.024	0.020	0.025	0.030*
	(0.016)	(0.017)	(0.017)	(0.016)	(0.017)	(0.017)
WTO_{ijt}	-0.24	-0.25	-0.30*	-0.22	-0.33*	-0.34**
	(0.18)	(0.18)	(0.17)	(0.18)	(0.17)	(0.17)
EU_{ijt}	-0.39***	-0.40***	-0.23***	-0.45***	-0.29***	-0.17**
	(0.097)	(0.096)	(0.087)	(0.10)	(0.087)	(0.073)
N. Obs.	12433	12433	12433	12433	12433	12433
R-squared	0.988	0.988	0.988	0.988	0.988	0.988
AIC	9.63172e+11	9.64496e+11	9.70289e+11	9.63092e+11	9.67649e+11	9.69164e+11
BIC	9.63172e+11	9.64496e+11	9.70289e+11	9.63092e+11	9.67649e+11	9.69164e+11
ω_{ij} **– Bilateral-FE**	Yes	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Host-time-FE**	Yes	Yes	Yes	Yes	Yes	Yes
ω_{it} **– Home-time-FE**	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors clustered by host-home pairs in parentheses; * p<0.1, ** p<0.05, *** p<0.01
Model M1 includes simple averages of stocks of NTMs on all non-zero trade flows; model M2 includes simple averages of stocks of NTMs on all products including zero-trade flows; model M3 includes import-weighted averages of stocks of NTMs on all positive trade flows; model M4 includes simple averages of stocks of NTMs on only manufacturing positive trade flows; model M5 includes import-weighted averages of stocks of NTMs on only manufacturing positive trade flows; and model M6 includes the number of NTM notifications notified to the WTO in each year.

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Verein „Wiener Institut für Internationale Wirtschaftsvergleiche“ (wiiw),
Wien 6, Rahlgasse 3

ZVR-Zahl: 329995655

Postanschrift: A 1060 Wien, Rahlgasse 3, Tel: [+431] 533 66 10, Telefax: [+431] 533 66 10 50
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